

CHAPTER

12

Activity-Based Management

AFTER STUDYING THIS CHAPTER, YOU SHOULD BE ABLE TO:

1. Describe how activity-based management and activity-based costing differ.
2. Define process value analysis.
3. Describe activity-based financial performance measurement.
4. Discuss the implementation issues associated with an activity-based management system.
5. Explain how activity-based management is a form of responsibility accounting, and tell how it differs from financial-based responsibility accounting.

Many firms operate in rapidly changing environments. Typically, these firms face stiff national and international competition. This stringent competitive environment demands that firms offer customized products and services to diverse customer segments. This, in turn, means that firms must find cost efficient ways of producing high-variety, low-volume products. To find ways to improve performance, firms operating in this kind of environment not only must know what it currently *costs* to do things, but they must also evaluate *why* and *how* they do things. Improving performance translates into constantly searching for ways to eliminate waste—a process known as **continuous improvement**. Activity-based costing and activity-based management are important tools in this ongoing improvement effort.

OBJECTIVE 1

Describe how activity-based management and activity-based costing differ.

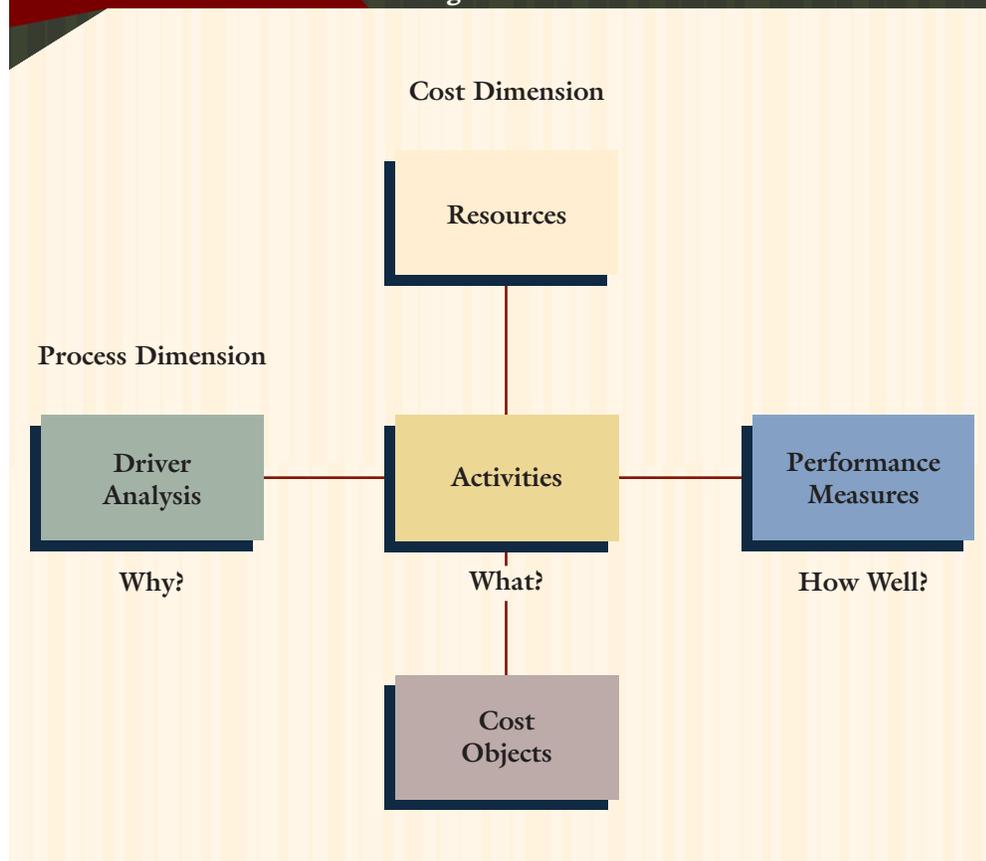
The Relationship of Activity-Based Costing and Activity-Based Management

Activity accounting is an essential factor for operationalizing continuous improvement. Processes are the source of many of the improvement opportunities that exist within an organization. Processes are made up of activities that are linked to perform a specific objective. Improving processes means improving the way activities are performed. Thus, management of activities, not costs, is the key to successful control for firms operating in continuous improvement environments. The realization that activities are crucial to both improved product costing and effective control has led to a new view of business processes called activity-based management.

Activity-based management (ABM) is a systemwide, integrated approach that focuses management's attention on activities with the objectives of improving customer value and the profit achieved by providing this value. ABC is the major source of information for activity-based management. Thus, the activity-based management model has two dimensions: a cost dimension and a process dimension. This two-dimensional model is presented in Exhibit 12-1. The cost dimension provides cost information about resources, activities, and cost objects of interests such as products, customers, suppliers, and distribution channels. The objective of the cost dimension is improving the accuracy of cost assignments. As the model suggests, the cost of resources is traced to activities, and then the cost of activities is assigned to cost objects. This activity-based costing dimension is useful for product costing, strategic cost management, and tactical analysis. The second dimension, the process dimension, provides information about what activities are performed, why they are performed, and how well they are performed. This dimension's

EXHIBIT 12-1

The Two-Dimensional Activity-Based Management Model



objective is cost reduction. It is this dimension that provides the ability to engage in and measure continuous improvement. To understand how the process view connects with continuous improvement, a more explicit understanding of process value analysis is needed.

Process Value Analysis

Process value analysis (PVA) is fundamental to activity-based responsibility accounting, focuses on accountability for activities rather than costs, and emphasizes the maximization of systemwide performance instead of individual performance. Process value analysis moves activity management from a conceptual basis to an operational basis. As the model in Exhibit 12-1 illustrates, process value analysis is concerned with (1) *driver analysis*, (2) *activity analysis*, and (3) *performance measurement*.

OBJECTIVE 2
Define process value analysis.

Driver Analysis: Defining Root Causes

Managing activities requires an understanding of what factors cause activities to be performed and what causes activity costs to change. Activities consume inputs (resources) and produce outputs. For example, if the activity is maintaining the payroll master file, the resources used would be such things as a payroll clerk, a computer, a printer, computer paper, and disks. The output would be an updated employee file. An **activity output measure** is the number of times the activity is performed. It is the quantifiable measure of the output. For example, the number of employee files maintained is a possible output measure for maintaining the payroll master file.

The output measure calculates the demands placed on an activity and is an *activity driver*. As the demands for an activity change, the cost of the activity can change. For example, as the number of employee files maintained increases, the activity of maintaining the master payroll may need to consume more inputs (labor, disks, paper, and so on). However, output measures (activity drivers), such as the number of files maintained, may not and usually do not correspond to the *root causes* of activity costs; rather, they are the consequences of the activity being performed. The purpose of *driver analysis* is to reveal the root causes. Thus, **driver analysis** is the effort expended to identify those factors that are the root causes of activity costs. For example, an analysis may reveal that the root cause of treating and disposing of toxic waste is product design. Once the root cause is known, then action can be taken to improve the activity. Specifically, creating a new product design may reduce or eliminate the cost of treating and disposing of toxic waste.

Often, several activities may have the same root cause. For example, the costs of inspecting incoming components (output measure = number of inspection hours) and reordering (output measure = number of reorders) may both be caused by poor quality of purchased components. By working with carefully selected suppliers to help them improve their product quality, both activities may be improved. Typically, root causes are identified by asking one or more “why” questions. Example: Why are we inspecting incoming components? Answer: Because some may be defective. Question: Why are we reordering components? Answer: Because some components are judged to be defective by the inspection. Question: Why are some purchased components defective? Answer: Because our suppliers are not providing reliable components. Once the answers to the why questions are obtained, then the answers to “how” questions are possible. Example: How do we improve the quality of incoming components? Answer: By selecting (or developing) suppliers that provide higher-quality components. The why questions identify the root causes, and the how questions enable management to identify ways to improve.

Activity Analysis: Identifying and Assessing Value Content

The heart of process value analysis is *activity analysis*. **Activity analysis** is the process of identifying, describing, and evaluating the activities an organization performs. Ac-

tivity analysis should produce four outcomes: (1) what activities are performed, (2) how many people perform the activities, (3) the time and resources required to perform the activities, and (4) an assessment of the value of the activities to the organization, including a recommendation to select and keep only those that add value. Steps 1–3 have been described in Chapter 4. Those steps were critical for assigning costs. Step 4, determining the value-added content of activities, is concerned with cost reduction rather than cost assignment. Thus, this may be considered the most important part of activity analysis. Activities can be classified as *value-added* or *non-value-added*.

Value-Added Activities

Value-added activities are those activities necessary to remain in business. Value-added activities contribute to customer value and/or help meet an organization's needs. Activities that comply with legal mandates are value-added because they exist to meet organizational needs. Moreover, they add to customer value by allowing the business to continue operating so that the products and services desired by the customer can be obtained. Even though mandated activities are necessary, customers should insist that they be performed as efficiently as possible to reduce the cost impact on goods and services. Examples of mandated activities include those needed to comply with the reporting requirements of the SEC and the filing requirements of the IRS. The remaining activities in the firm are *discretionary*. Classifying discretionary activities as value-added is more of an art than a science and depends heavily on subjective judgment. However, it is possible to identify three conditions, which if simultaneously met, are sufficient to classify a discretionary activity as value-added. These conditions are as follows: (1) the activity produces a change of state, (2) the change of state was not achievable by preceding activities, and (3) the activity enables other activities to be performed.

For example, consider the production of metal components used in medical equipment. The first activity, gating, creates a wax mold replica of the final product. The next activity, shelling, creates a ceramic shell around the wax mold. After removing the wax, molten metal is poured into the resulting cavity. The shell is then broken to reveal the desired metal component. The gating activity is value-added because (1) it causes a change of state—unformed wax is transformed into a wax mold, (2) no prior activity was supposed to create this change of state, and (3) it enables the shelling activity to be performed. Similar comments hold for the shelling and pouring activities. The value-added properties are easy to see for operational activities like gating and shelling, but what about a more general activity like supervising production workers? A managerial activity is specifically designed to manage other value-added activities—to ensure that they are performed in an efficient and timely manner. Supervision certainly satisfies the enabling condition. Is there a change in state? There are two ways of answering in the affirmative. First, supervising can be viewed as an enabling resource that is consumed by the operational activities that do produce a change of state. Thus, supervising is a secondary activity that serves as an input needed to help bring about the change of state expected for value-added primary activities. Second, it could be argued that the supervision brings order by changing the state from uncoordinated activities to coordinated activities.

Once value-added activities are identified, we can define value-added costs. **Value-added costs** are the costs to perform value-added activities with perfect efficiency. Implicit in this definition is the notion that value-added activities may contain nonessential actions that create unnecessary cost.

Non-Value-Added Activities

Non-value-added activities are unnecessary and are not valued by internal or external customers. Non-value-added activities often are those that fail to produce a change in state or those that replicate work because it wasn't done correctly the first time. Inspecting wax molds, for example, is a non-value-added activity. Inspection is a state-detection activity, not a state-changing activity. (It tells us the state of the mold—whether

or not it is of the right shape.) As a general rule, state-detection activities are not value-added. Now, consider the activity of recasting molds that fail inspection. This recasting is designed to bring the mold from a nonconforming state to a conforming state. Thus, a change of state occurs. Yet, the activity is non-value-added because it *repeats* work; it is doing something that should have been done by preceding activities (the first time the wax mold was cast). **Non-value-added costs** are costs that are caused either by non-value-added activities or the inefficient performance of value-added activities. Because of increased competition, many firms are attempting to eliminate non-value-added activities and nonessential portions of value-added activities because they add unnecessary cost and impede performance. Therefore, activity analysis attempts to identify and eventually eliminate all unnecessary activities and, simultaneously, increase the efficiency of necessary activities.

COST MANAGEMENT

US Airways implemented an activity-based cost management (ABCM) system to manage its in-house engine maintenance business unit. First, ABCM helped determine the cost of engine maintenance with increased accuracy. Second, ABCM provided operational and financial information that allowed work teams to identify opportunities for improvement. Thus, ABCM provided accurate cost information and simultaneously revealed opportunities for improvement. ABCM identified 410 activities—activities such as tear down, welding, waiting for tooling, and rework.

Technology in Action

Of the 410 activities, 47 were identified as non-value-added. The non-value-added activities were rank-ordered on the basis of activity cost, providing information about where the most significant process improvement opportunities were located. Root cause analysis was undertaken by the various work teams to determine the causes for the efforts being expended on the non-value-added activities. Once the root causes were identified, the teams took action to reduce or eliminate the non-value-added activities. The net effect was to produce \$4.3 million in process savings per year.

Source: Taken from Joe Donnelly and Dave Buchanan, “Implementation Lands \$4.3 Million in Process Improvement Savings,” an online article at <http://www.bettermanagement.com> as of September 7, 2004.

Assessing the value content of activities enables managers to eliminate waste. As waste is eliminated, costs are reduced. Cost reduction *follows* the elimination of waste. Note the value of managing the *causes* of the costs rather than the costs themselves. Increasing the efficiency of a non-value-added activity is not a good long-term strategy. For example, training inspectors in sampling procedures may increase the efficiency of the activity of inspecting incoming components, but it is better to implement a supplier evaluation program that leads to suppliers that provide defect-free components, thus eliminating the need for inspection.

Examples of Non-Value-Added Activities

Reordering parts, expediting production, and rework due to defective parts are examples of non-value-added activities. Other examples include warranty work, handling customer complaints, and reporting defects. Non-value-added activities can exist anywhere in the organization. In the manufacturing operation, five major activities are often cited as wasteful and unnecessary:

1. *Scheduling.* An activity that uses time and resources to determine when different products have access to processes (or when and how many setups must be done) and how much will be produced.
2. *Moving.* An activity that uses time and resources to move materials, work in process, and finished goods from one department to another.
3. *Waiting.* An activity in which materials or work in process use time and resources by waiting on the next process.
4. *Inspecting.* An activity in which time and resources are spent ensuring that the product meets specifications.

5. *Storing*. An activity that uses time and resources while a good or material is held in inventory.

None of these activities adds any value for the customer. Scheduling, for example, is not necessary if the company has learned how to produce on demand. Similarly, inspecting would not be necessary if the product is produced correctly the first time. The challenge of activity analysis is to find ways to produce the good without using any of these activities.

Cost Reduction through Activity Management

Competitive conditions dictate that companies must deliver products the customers want, on time, and at the lowest possible cost. This means that an organization must continually strive for cost improvement. **Kaizen costing** is characterized by constant, incremental improvements to existing processes and products. Activity management is a fundamental part of kaizen costing. Activity management can reduce costs in four ways:¹

1. Activity elimination
2. Activity selection
3. Activity reduction
4. Activity sharing

Activity elimination focuses on eliminating non-value-added activities. For example, the activity of expediting production seems necessary at times to ensure that customers' needs are met. Yet, this activity is necessary only because of the company's failure to produce efficiently. By improving cycle time, a company may eventually eliminate the need for expediting. Cost reduction then follows.

Activity selection involves choosing among various sets of activities that are caused by competing strategies. Different strategies cause different activities. Different product design strategies, for example, can require significantly different activities. Activities, in turn, cause costs. Each product design strategy has its own set of activities and associated costs. All other things being equal, the lowest cost design strategy should be chosen. In a kaizen cost framework, *redesign* of existing products and processes can lead to a different, lower cost set of activities. Thus, activity selection can have a significant effect on cost reduction.

Activity reduction decreases the time and resources required by an activity. This approach to cost reduction should be aimed primarily at improving the efficiency of necessary activities or act as a short-term strategy for moving non-value-added activities toward the point of elimination. For example, by improving product quality, customer complaints should decrease and, consequently, the demand for handling customer complaints should decrease.

Activity sharing increases the efficiency of necessary activities by using economies of scale. Specifically, the quantity of the cost driver is increased without increasing the total cost of the activity itself. This lowers the per-unit cost of the cost driver and the amount of cost traceable to the products that consume the activity. For example, a new product can be designed to use components already being used by other products. By using existing components, the activities associated with these components already exist, and the company avoids the creation of a whole new set of activities.

Assessing Activity Performance

Activity performance measurement is designed to assess how well an activity was performed and the results achieved. Measures of activity performance are both financial and nonfinancial and center on three major dimensions: (1) efficiency, (2) quality, and (3) time. *Efficiency* is concerned with the relationship of activity outputs to activity inputs. For example, activity efficiency is improved by producing the same activity output with

1. Peter B. B. Turney, "How Activity-Based Costing Helps Reduce Cost," *Journal of Cost Management* (Winter 1991): 29-35.

less inputs. Costs trending downward is evidence that activity efficiency is improving. *Quality* is concerned with doing the activity right the first time it is performed. If the activity output is defective, then the activity may need to be repeated, causing unnecessary cost and reduction in efficiency. The *time* required to perform an activity is also critical. Longer times usually mean more resource consumption and less ability to respond to customer demands. Time measures of performance tend to be nonfinancial, whereas efficiency and quality measures are both financial and nonfinancial.

Financial Measures of Activity Efficiency

Assessing activity performance should reveal the current level of efficiency and the potential for increased efficiency. Both financial and nonfinancial measures are used to reveal past performance and signal future potential gains in efficiency. Financial measures of activity performance are emphasized in this chapter, and nonfinancial measures are discussed in Chapter 13. **Financial measures** of performance should provide specific information about the dollar effects of activity performance changes. Thus, financial measures should indicate both potential and actual savings. Financial measures of activity efficiency include (1) value- and non-value-added activity costs, (2) trends in activity costs, (3) kaizen standard setting, (4) benchmarking, (5) activity flexible budgeting, and (6) activity capacity management.

Reporting Value- and Non-Value-Added Costs

Reducing non-value-added costs is one way to increase activity efficiency. A company's accounting system should distinguish between value-added costs and non-value-added costs because improving activity performance requires eliminating non-value-added activities and optimizing value-added activities. A firm should identify and formally report the value- and non-value-added costs of each activity. Highlighting non-value-added costs reveals the magnitude of the waste the company is currently experiencing, thus providing some information about the potential for improvement. This encourages managers to place more emphasis on controlling non-value-added activities. Progress can then be assessed by preparing trend and cost reduction reports. Tracking these costs over time permits managers to assess the effectiveness of their activity management programs.

Knowing the amount of costs saved is important for strategic purposes. For example, if an activity is eliminated, then the costs saved should be traceable to individual products. These savings can produce price reductions for customers, making the firm more competitive. Changing the pricing strategy, however, requires knowledge of the cost reductions realized by activity analysis. A cost-reporting system, therefore, is an important ingredient in an activity-based responsibility accounting system.

Value-added costs are the only costs that an organization should incur. The *value-added standard* calls for the complete elimination of non-value-added activities; for these activities, the optimal output is zero, with zero cost. The value-added standard also calls for the complete elimination of the inefficiency of activities that are necessary but inefficiently carried out. Hence, value-added activities also have an optimal output level. A **value-added standard**, therefore, identifies the optimal activity output. Identifying the optimal activity output requires activity output measurement.

Setting value-added standards does not mean that they will be (or should be) achieved immediately. The idea of continuous improvement is to move toward the ideal. Workers (teams) can be rewarded for improvement. Moreover, nonfinancial activity performance measures can be used to supplement and support the goal of eliminating non-value-added costs (these are discussed later in the chapter). Finally, measuring the efficiency of individual workers and supervisors is not the way to eliminate non-value-added activities. Remember, activities cut across departmental boundaries and are part of processes. Focusing on activities and providing incentives to improve processes is a more productive approach. Improving the process should lead to improved results.

OBJECTIVE 3

Describe activity-based financial performance measurement.

By comparing actual activity costs with value-added activity costs, management can assess the level of activity inefficiency and the potential for improvement. To identify and calculate value- and non-value-added costs, output measures for each activity must be defined. Once output measures are defined, then value-added standard quantities (SQ) for each activity can be defined. Value-added costs can be computed by multiplying the value-added standard quantities by the price standard (SP). Non-value-added costs can be calculated as the difference between the actual level of the activity's output (AQ) and the value-added level (SQ), multiplied by the standard price. These formulas are presented in Exhibit 12-2. Some further explanation is needed.

EXHIBIT 12-2**Formulas for Value- and Non-Value-Added Costs**

$$\begin{aligned}\text{Value-added costs} &= SQ \times SP \\ \text{Non-value-added costs} &= (AQ - SQ)SP\end{aligned}$$

Where

- SQ = The value-added output level for an activity
- SP = The standard price per unit of activity output measure
- AQ = The actual quantity used of flexible resources or the practical activity capacity acquired for committed resources

For flexible resources (resources acquired as needed), AQ is the actual quantity of activity used. For committed resources (resources acquired in advance of usage), AQ represents the actual quantity of activity capacity acquired, as measured by the activity's practical capacity. This definition of AQ allows the computation of non-value-added costs for both variable and fixed activity costs. For fixed activity costs, SP is the budgeted activity costs divided by AQ , where AQ is practical activity capacity.

To illustrate the power of these concepts, consider the following four production activities for a manufacturing firm: purchasing materials, molding, inspecting molds, and grinding imperfect molds. Purchasing and molding are necessary activities; inspection and grinding are unnecessary. The following data pertain to the four activities:

<i>Activity</i>	<i>Activity Driver</i>	<i>SQ</i>	<i>AQ</i>	<i>SP</i>
Purchasing	Purchasing hours	20,000	23,000	\$20
Molding	Molding hours	30,000	34,000	12
Inspecting	Inspection hours	0	6,000	15
Grinding	Number of units	0	5,000	6

Notice that the value-added standards (SQ) for inspection and grinding call for their elimination. Ideally, there should be no defective molds; by improving quality, changing production processes, and so on, inspection and grinding can eventually be eliminated. Exhibit 12-3 classifies the costs for the four activities as value-added or non-value-added. For simplicity and to show the relationship to actual costs, the actual price per unit of the activity driver is assumed to be equal to the standard price. In this case, the value-added cost plus the non-value-added cost equals actual cost.

The cost report in Exhibit 12-3 allows managers to see the non-value-added costs; as a consequence, it emphasizes the opportunity for improvement. By redesigning the products and reducing the number of parts required, purchase time can be reduced. By improving the molding process and labor skill, management can reduce the demands for molding time, inspection, and grinding. Thus, reporting value- and non-value-added

EXHIBIT 12-3		Value- and Non-Value-Added Cost Report for the Year Ended December 31, 2006	
Activity	Value-Added Costs	Non-Value-Added Costs	Actual Costs
Purchasing	\$400,000	\$ 60,000	\$460,000
Molding	360,000	48,000	408,000
Inspecting	0	90,000	90,000
Grinding	0	30,000	30,000
Total	<u>\$760,000</u>	<u>\$228,000</u>	<u>\$988,000</u>

costs at a point in time may trigger actions to manage activities more effectively. Once they see the amount of waste, managers may be induced to search for ways to improve activities and bring about cost reductions. Reporting these costs may also help managers improve planning, budgeting, and pricing decisions. For example, a manager might consider it possible to lower a selling price to meet a competitor's price if that manager can see the potential for reducing non-value-added costs to absorb the effect of the price reduction.

Trend Reporting of Non-Value-Added Costs

As managers take actions to improve activities, do the cost reductions follow as expected? One way to answer this question is to compare the costs for each activity over time. The goal is activity improvement as measured by cost reduction. We should see a decline in non-value-added costs from one period to the next—provided the activity improvement initiatives are effective. Assume, for example, that at the beginning of 2007, the production and molding process was redesigned and the employees in molding were trained in a new work technique. The objective of the initiatives was to improve activity performance. How effective were these decisions? Did cost reductions occur as expected? Exhibit 12-4 provides a cost report that compares the *non-value-added* costs of 2007 with those that occurred in 2006. The 2007 costs are assumed but would be computed the same way as shown for 2006. We assume that *SQ* is the same for both years.

The trend report reveals that more than half of the non-value-added costs have been eliminated. There is still ample room for improvement, but activity improvement so far has been successful. Reporting non-value-added costs, however, not only reveals reduction but also indicates where the reduction occurred. It provides managers with

EXHIBIT 12-4		Trend Report: Non-Value-Added Costs	
Activity	Non-Value-Added Costs		
	2006	2007	Change
Purchasing	\$ 60,000	\$ 20,000	\$ 40,000
Molding	48,000	35,000	13,000
Inspecting	90,000	30,000	60,000
Grinding	30,000	15,000	15,000
Total	<u>\$228,000</u>	<u>\$100,000</u>	<u>\$128,000</u>

information on how much potential for cost reduction remains, assuming that the value-added standards remain the same. Value-added standards, however, like other standards, are not cast in stone. New technology, new designs, and other innovations can change the nature of activities performed. As new ways for improvement surface, value-added standards can change. Managers should not become content but should continually seek higher levels of efficiency.

Drivers and Behavioral Effects

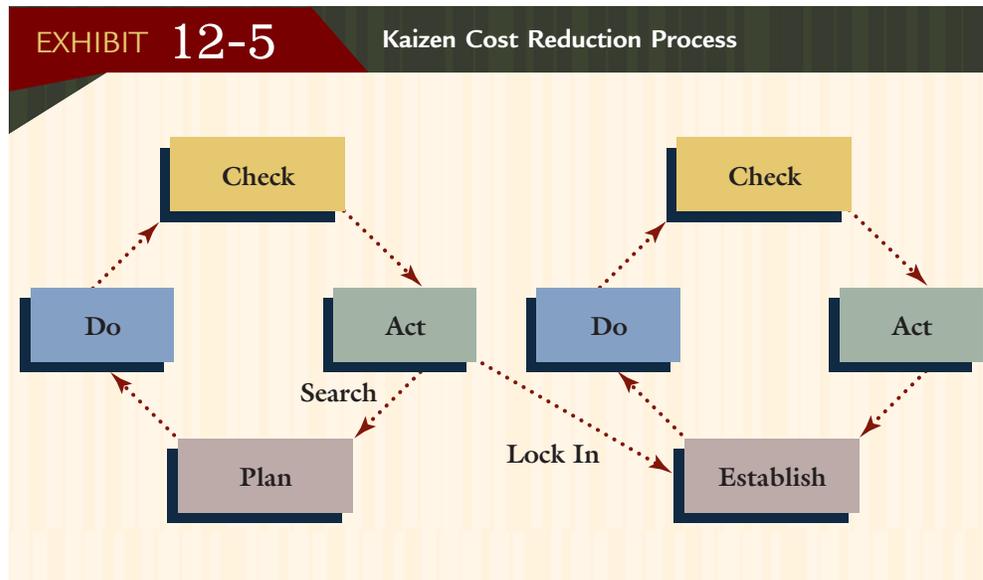
Activity output measures are needed to compute and track non-value-added costs. Reducing a non-value-added activity should produce a reduction in the demand for the activity and, therefore, a reduction in the activity output measures. If a team's performance is affected by its ability to reduce non-value-added costs, then the selection of activity drivers (as output measures) and the way the drivers are used can affect behavior. For example, if the output measure for setup costs is chosen as setup time, an incentive is created for workers to reduce setup time. Since the value-added standard for setup costs calls for their complete elimination, then the incentive to drive setup time to zero is compatible with the company's objectives, and the induced behavior is beneficial.

Suppose, however, that the objective is to reduce the number of unique parts a company processes, thus reducing the demand for activities such as purchasing and incoming inspection. If the costs of these activities are assigned to products based on the number of parts, the incentive created is to reduce the number of parts in a product. Yet, if too many parts are eliminated, the functionality of the product may be reduced to a point where its marketability is adversely affected. Identifying the value-added standard number of parts for each product through the use of functional analysis can discourage this type of behavior.² Designers can then be encouraged to reduce the non-value-added costs by designing to reach the value-added standard number of parts. The standard has provided a concrete objective and defined the kind of behavior that the incentive allows.

The Role of Kaizen Standards

Kaizen costing is concerned with reducing the costs of *existing* products and processes. In operational terms, this translates into reducing non-value-added costs. Controlling this cost reduction process is accomplished through the repetitive use of two major sub-cycles: (1) the kaizen or continuous improvement cycle and (2) the maintenance cycle. The kaizen subcycle is defined by a Plan-Do-Check-Act sequence. If a company is emphasizing the reduction of non-value-added costs, the amount of improvement planned for the coming period (month, quarter, etc.) is set (the *Plan* step). A **kaizen standard** reflects the planned improvement for the upcoming period. The planned improvement is assumed to be attainable, and kaizen standards are a type of currently attainable standard. Actions are taken to implement the planned improvements (the *Do* step). Next, actual results (e.g., costs) are compared with the kaizen standard to provide a measure of the level of improvement attained (the *Check* step). Setting this new level as a minimum standard for future performance locks in the realized improvements and simultaneously initiates the maintenance cycle and a search for additional improvement opportunities (the *Act* step). The maintenance cycle follows a traditional Establish-Do-Check-Act sequence. A standard is set based on prior improvements (locking in these improvements). Next, actions are taken (the *Do* step) and the results checked to ensure that performance conforms to this new level (the *Check* step). If not, then corrective actions are taken to restore performance (the *Act* step). The kaizen cost reduction process is summarized in Exhibit 12-5.

2. Functional analysis compares the price customers are willing to pay for a particular product function with the cost of providing that function.



For example, assume that an automotive parts division engages in a setup activity for the subassemblies that it produces. The value-added standard for this activity calls for zero setup hours with a cost of \$0 per batch of subassemblies. Assume that in the prior year, the company used eight hours to set up each batch at a cost of \$18 per hour. The actual setup cost per batch was \$144 ($\18×8 hrs.). This was also the non-value-added cost. For the coming quarter, the company is planning on implementing a new setup method developed by its industrial engineers that is expected to reduce setup time by 50 percent. Thus, the planned cost reduction is \$72 per batch. The kaizen standard per batch is now \$72: defined as four hours per setup with a standard cost of \$18 per hour, which is equal to the actual prior-year cost less the targeted reduction ($\$144 - \72). Now, suppose that the actual cost achieved after implementing the new production process is \$72. The actual improvements expected did materialize, and the new minimum standard is \$72 per batch, locking in the improvements. Until further improvements are achieved, setup costs should be no more than \$72 per setup. For subsequent periods, additional improvements would be sought and a new kaizen standard defined. The ultimate objective is to reduce setup time and cost to zero through a series of kaizen improvements.

In some cases, companies have formalized the process of revising standards. For example, **Shionogi Pharmaceuticals** first assesses whether the improvements are attributable to kaizen activities or to random fluctuations. If kaizen activities are the source, Shionogi then evaluates the *sustainability* of the kaizen improvements. Improvements are locked in through revision of standards only if the improvements are judged to be sustainable.³

Benchmarking

Benchmarking is complimentary to kaizen costing and activity-based management, and it can be used as a search mechanism to identify opportunities for improvement. **Benchmarking** uses best practices found within and outside the organization as the standard for evaluating and improving activity performance. The objective of benchmarking is to become the best at performing activities and processes (thus, benchmarking represents an important activity management methodology). The approach certainly seems

3. Robin Cooper, *When Lean Enterprises Collide* (Boston: Harvard Business School Press, 1995).

to have considerable merit. A study of 111 benchmarking companies revealed benchmarking returns ranging from \$1.4 million to \$189.4 million.⁴

Internal Benchmarking

Benchmarking against internal operations is called *internal benchmarking*. Within an organization, different units (for example, different plant sites) that perform the same activities are compared. The unit with the best performance for a given activity sets the standard. Other units then have a target to meet or exceed. Furthermore, the best-practices unit can share information with other units on how it has achieved its superior results. Internal benchmarking has several advantages. First, a significant amount of information is often readily available that can be shared throughout the organization. Second, immediate cost reductions are often realized. Third, the best internal standards that spread throughout the organization become the benchmark for comparison against external benchmarking partners. This last advantage also suggests the major disadvantage of internal benchmarking. Specifically, the best internal performance may fall short of what others are doing, particularly direct competitors.

There are numerous examples of the benefits of internal benchmarking.⁵ **Thomson Corporation** collected and broadcast best practices through internal benchmarking throughout the company and saved \$200 million in one year. **Chevron** saved \$150 million by transferring energy use management techniques throughout the company. **Public Service Enterprise Group** used internal benchmarking to improve the process for ripping up a street, repairing a line, backfilling the hole, and repaving the area. The improvement dropped costs from an average of \$2,200 to just \$200 per incident.

External Benchmarking

Benchmarking that involves comparison with others outside the organization is called *external benchmarking*. The three types of external benchmarking are competitive benchmarking, functional benchmarking, and generic benchmarking. Competitive benchmarking is a comparison of activity performance with direct competitors. The main problem with competitive benchmarking is that it is very difficult to obtain information beyond that found in the public domain. At times, however, it is possible. **The Ritz-Carlton**, for example, dramatically improved its housekeeping process by studying the best practices of a competitor.⁶ Functional benchmarking is a comparison with firms that are in the same industry but do not compete in the same markets. For example, a Japanese communications firm might be able to compare its customer service process with that of **AT&T**. Generic benchmarking studies the best practices of noncompetitors outside a firm's industry. Certain activities and processes are common to all organizations. If superior external best practices can be identified, then they can be used as standards to motivate internal improvements. For example, **Verizon** improved its field service process by studying the field service process of an elevator company.⁷

Activity Flexible Budgeting

The ability to identify changes in activity costs as activity output changes allows managers to more carefully plan and monitor activity improvements. **Activity flexible budgeting** is the prediction of what activity costs will be as activity output changes. Variance analysis within an activity framework makes it possible to improve traditional budgetary performance reporting. It also enhances the ability to manage activities.

4. *Benchmarking: Leveraging Best-Practices Strategies*, an APQC white paper (see knowledge management content), accessed October 6, 2004 at <http://www.APQC.org/portal/apqc/ksn>.

5. Frank Jossi, "Take a Peek Inside," *HRMagazine* (June 2002): 46–52.

6. Robert C. Camp, *Business Process Benchmarking* (Milwaukee, WI: ASQC Quality Press, 1995): 273.

7. *Ibid.*

In a functional-based approach, budgeted costs for the actual level of activity are obtained by assuming that a single unit-based driver (units of product or direct labor hours) drives all costs. A cost formula is developed for each cost item as a function of units produced or direct labor hours. Exhibit 12-6 presents a functional-based flexible budget based on direct labor hours. If, however, costs vary with respect to more than one driver and the drivers are not highly correlated with direct labor hours, then the predicted costs can be misleading.

	Cost Formula		Direct Labor Hours	
	Fixed	Variable	10,000	20,000
Direct materials	—	\$10	\$100,000	\$200,000
Direct labor	—	8	80,000	160,000
Maintenance	\$ 20,000	3	50,000	80,000
Machining	15,000	1	25,000	35,000
Inspections	120,000	—	120,000	120,000
Setups	50,000	—	50,000	50,000
Purchasing	<u>220,000</u>	<u>—</u>	<u>220,000</u>	<u>220,000</u>
Total	<u>\$425,000</u>	<u>\$22</u>	<u>\$645,000</u>	<u>\$865,000</u>

The solution, of course, is to build flexible budget formulas for more than one driver. Cost estimation procedures (high-low method, the method of least squares, and so on) can be used to estimate and validate the cost formulas for each activity. In principle, the variable cost component for each activity should correspond to resources acquired as needed (flexible resources), and the fixed cost component should correspond to resources acquired in advance of usage (committed resources). This multiple-formula approach allows managers to predict more accurately what costs should be for different levels of activity usage, as measured by the activity output measure. These costs can then be compared with the actual costs to help assess budgetary performance. Exhibit 12-7 illustrates an activity flexible budget. Notice that the budgeted amounts for direct materials and direct labor are the same as those reported in Exhibit 12-6; they use the same activity output measure. The budgeted amounts for the other items differ significantly from the traditional amounts because the activity output measures differ.

Assume that the first activity level for each driver in Exhibit 12-7 corresponds to the actual activity usage levels. Exhibit 12-8 compares the budgeted costs for the actual activity usage levels with the actual costs. One item is on target, and the other six items are mixed. The net outcome is a favorable variance of \$21,500.

The performance report in Exhibit 12-8 compares total budgeted costs for the actual level of activity with the total actual costs for each activity. It is also possible to compare the actual fixed activity costs with the budgeted fixed activity costs, and the actual variable activity costs with the budgeted variable costs. For example, assume that the actual fixed inspection costs are \$82,000 (due to a midyear salary adjustment, reflecting a more favorable union agreement than anticipated) and that the actual variable inspection costs are \$43,500. The variable and fixed budget variances for the inspection activity are computed on page 562.

EXHIBIT 12-7 Activity Flexible Budget

	Formula		Level of Activity	
	Fixed	Variable	10,000	20,000
DRIVER: DIRECT LABOR HOURS				
Direct materials	\$—	\$10	\$100,000	\$200,000
Direct labor	—	8	80,000	160,000
Subtotal	<u>\$—</u>	<u>\$18</u>	<u>\$180,000</u>	<u>\$360,000</u>
DRIVER: MACHINE HOURS				
Maintenance	\$20,000	\$5.50	\$64,000	\$108,000
Machining	<u>15,000</u>	<u>2.00</u>	<u>31,000</u>	<u>47,000</u>
Subtotal	<u>\$35,000</u>	<u>\$7.50</u>	<u>\$95,000</u>	<u>\$155,000</u>
DRIVER: NUMBER OF SETUPS				
Inspections	\$80,000	\$2,100	\$132,500	\$143,000
Setups	—	1,800	45,000	54,000
Subtotal	<u>\$80,000</u>	<u>\$3,900</u>	<u>\$177,500</u>	<u>\$197,000</u>
DRIVER: NUMBER OF ORDERS				
Purchasing	\$211,000	\$1	\$226,000	\$236,000
Total			<u>\$678,500</u>	<u>\$948,000</u>

EXHIBIT 12-8 Activity-Based Performance Report*

	Actual Costs	Budgeted Costs	Budget Variance
Direct materials	\$101,000	\$100,000	\$ 1,000 U
Direct labor	80,000	80,000	—
Maintenance	55,000	64,000	9,000 F
Machining	29,000	31,000	2,000 F
Inspections	125,500	132,500	7,000 F
Setups	46,500	45,000	1,500 U
Purchasing	<u>220,000</u>	<u>226,000</u>	<u>6,000 F</u>
Total	<u>\$657,000</u>	<u>\$678,500</u>	<u>\$21,500 F</u>

*Actual levels of drivers: 10,000 direct labor hours, 8,000 machine hours, 25 setups, and 15,000 orders.

<i>Activity</i>	<i>Actual Cost</i>	<i>Budgeted Cost 25 Setups Level</i>	<i>Variance</i>
Inspection:			
Fixed	\$ 82,000	\$ 80,000	\$2,000 U
Variable	<u>43,500</u>	<u>52,500</u>	<u>9,000 F</u>
Total	<u>\$125,500</u>	<u>\$132,500</u>	<u>\$7,000 F</u>

Breaking each variance into fixed and variable components provides more insight into the source of the variation in planned and actual expenditures. Activity budgets also provide valuable information about capacity usage.

Activity Capacity Management

Activity capacity is the number of times an activity can be performed. Activity drivers measure activity capacity. For example, consider inspecting finished goods as the activity. A sample from each batch is taken to determine the batch's overall quality. The demand for the inspection activity determines the amount of activity capacity that is required. For instance, suppose that the number of batches inspected measures activity output. Now, suppose that 60 batches are scheduled to be produced. Then, the required capacity is 60 batches. Finally, assume that a single inspector can inspect 20 batches per year. Thus, three inspectors must be hired to provide the necessary capacity. If each inspector is paid a salary of \$40,000, the budgeted cost of the activity capacity is \$120,000. This is the cost of the resources (labor) acquired in advance of usage. The budgeted activity rate is \$2,000 per batch (\$120,000/60).

Several questions relate to activity capacity and its cost. First, what *should* the activity capacity be? The answer to this question provides the ability to measure the amount of improvement possible. Second, how much of the capacity acquired was actually used? The answer to this question signals a nonproductive cost and, at the same time, an opportunity for capacity reduction and cost savings.

Capacity Variances

Exhibit 12-9 illustrates the calculation of two capacity variances: the *activity volume variance* and the *unused capacity variance*. The **activity volume variance** is the difference between the actual activity level acquired (practical capacity, *AQ*) and the value-added standard quantity of activity that should be used (*SQ*). Assuming that inspection is a non-

EXHIBIT 12-9
Activity Capacity Variances

AQ = Activity capacity acquired (practical capacity)
SQ = Activity capacity used
AU = Actual usage of the activity
SP = Fixed activity rate

$SP \times SQ$	$SP \times AQ$	$SP \times AU$
$\$2,000 \times 0$	$\$2,000 \times 60$	$\$2,000 \times 40$
\$0	\$120,000	\$80,000
Volume Variance \$120,000 U		Unused Capacity Variance \$40,000 F

value-added activity, $SQ = 0$ is the value-added standard. The volume variance in this framework has a useful economic interpretation: it is the non-value-added cost of the inspection activity. It measures the amount of improvement that is possible through analysis and management of activities (\$120,000, in this example). However, since the supply of the activity in question (inspections) must be acquired in blocks (one inspector at a time), it is also important to measure the current demand for the activity (actual usage).

When supply exceeds demand by a large enough quantity, management can take action to reduce the quantity of the activity provided. Thus, the **unused capacity variance**, the difference between activity availability (AQ) and activity usage (AU), is important information that should be provided to management. The goal is to reduce the demand for the activity until such time as the unused capacity variance equals the volume variance. Why? Because the volume variance is a non-value-added cost and the unused activity variance measures the progress made in reducing this non-value-added cost. The calculation of the unused capacity variance is also illustrated in Exhibit 12-9. Notice that the unused capacity is 20 batches valued at \$40,000. Assume that this unused capacity exists because management has been engaged in a quality-improvement program that has reduced the need to inspect certain batches of products. This difference between the supply of the inspection resources and their usage should impact future spending plans (reduction of a non-value-added activity is labeled as favorable).

For example, we know that the supply of inspection resources is greater than its usage. Furthermore, because of the quality-improvement program, we can expect this difference to persist and even become greater (with the ultimate goal of reducing the cost of inspection activity to zero). Management now must be willing to exploit the unused capacity it has created. Essentially, activity availability can be reduced; thus, the spending on inspection can be decreased. A manager can use several options to achieve this outcome. Since the inspection demand has been reduced by 20 batches, the company needs only two full-time inspectors. The extra inspector could be permanently reassigned to an activity where resources are in short supply. If reassignment is not feasible, the company should lay off the extra inspector.

This example illustrates an important feature of activity capacity management. Activity improvement can create unused capacity, but managers must be willing and able to make the tough decisions to reduce resource spending on the redundant resources to gain the potential profit increase. Profits can be increased by reducing resource spending or by transferring the resources to other activities that will generate more revenues.

OBJECTIVE 4

Discuss the implementation issues associated with an activity-based management system.

Implementing Activity-Based Management

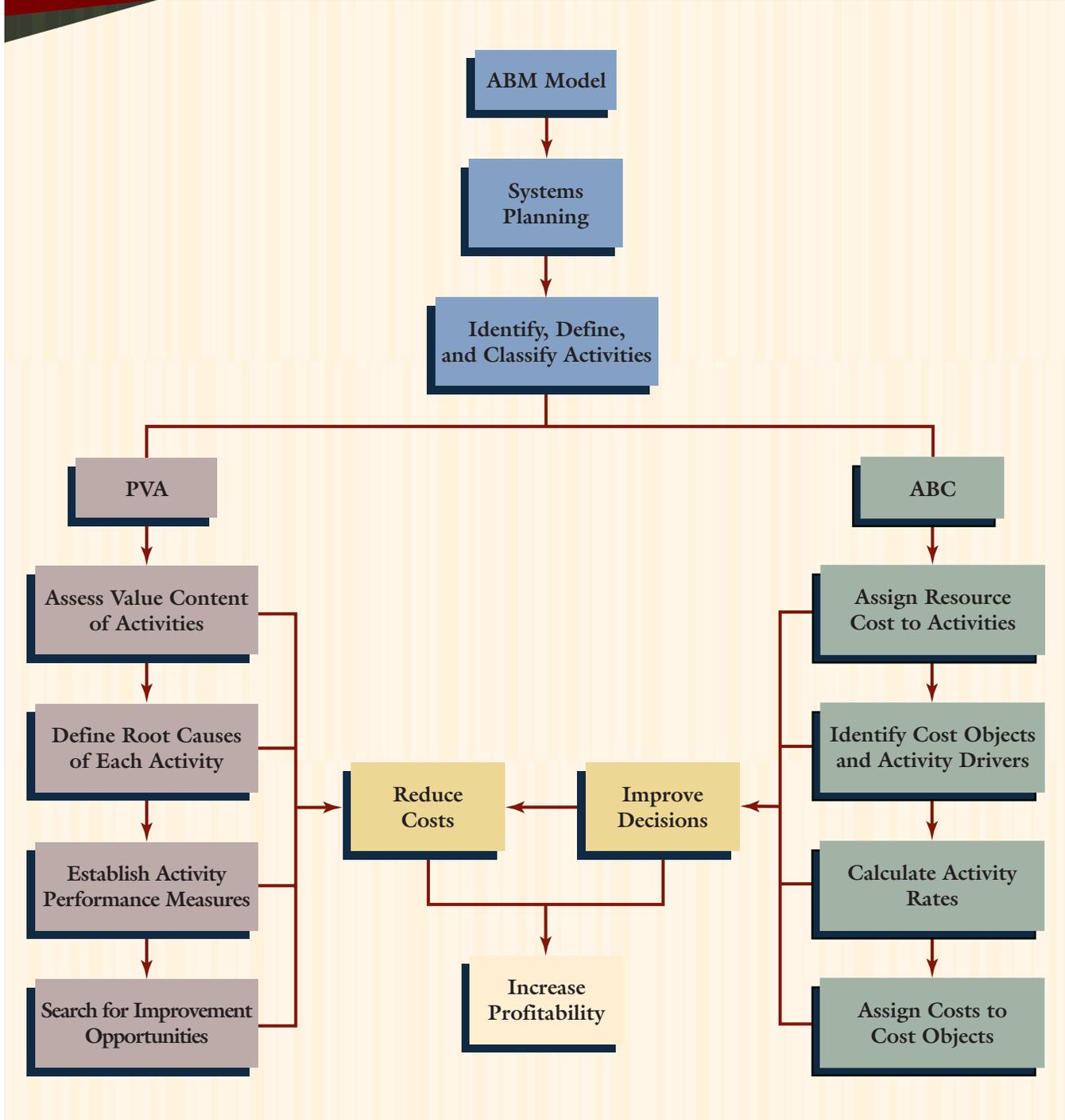
Activity-based management (ABM) is a more comprehensive system than an ABC system. ABM adds a process view to the cost view of ABC. ABM encompasses ABC and uses it as a major source of information. ABM can be viewed as an information system that has the broad objectives of (1) improving decision making by providing accurate cost information and (2) reducing costs by encouraging and supporting continuous improvement efforts. The first objective is the domain of ABC, while the second objective belongs to process value analysis. The second objective requires more detailed data than ABC's objective of improving the accuracy of costing assignments. If a company intends to use both ABC and PVA, then its approach to implementation must be carefully conceived. For example, if ABC creates aggregate cost pools based on homogeneity, much of the detailed activity information may not be needed. Yet, for PVA, this detail must be retained. Clearly, how to implement an ABM system is a major consideration. Exhibit 12-10 provides a representation of an ABM implementation model.

Discussion of the ABM Implementation Model

The model in Exhibit 12-10 shows that the overall objective of ABM is to improve a firm's profitability, an objective achieved by identifying and selecting opportunities for

EXHIBIT 12-10

ABM Implementation Model



improvement and using more accurate information to make better decisions. Root cause analysis, for example, reveals opportunities for improvement. By identifying non-value-added costs, priorities can be established based on the initiatives that offer the most cost reduction. Furthermore, the potential cost reduction itself is measured by ABC calculations.

Exhibit 12-10 also reveals that 10 steps define an ABM implementation: two common steps and four that are associated with either ABC or PVA. The PVA steps have

been discussed extensively in this chapter, whereas the ABC steps were discussed in Chapter 4. The two common steps are (1) systems planning and (2) activity identification, definition, and classification.

Systems Planning

Systems planning provides the justification for implementing ABM and addresses the following issues:

1. The purpose and objectives of the ABM system
2. The organization's current and desired competitive position
3. The organization's business processes and product mix
4. The timeline, assigned responsibilities, and resources required for implementation
5. The ability of the organization to implement, learn, and use new information

To obtain buy-in by operating personnel, the objectives of an ABM system must be carefully identified and related to the firm's desired competitive position, business processes, and product mix. The broad objectives have already been mentioned (improving accuracy and continuous improvement); however, it is also necessary to develop specific desired outcomes associated with each of these two objectives. For example, one specific outcome is that of changing the product mix based on more accurate costs (with the expectation that profits will increase). Another specific outcome is that of improving the firm's competitive position by increasing process efficiency through elimination of non-value-added activities. Planning also entails establishing a timeline for the implementation project, assigning specific responsibilities to individuals or teams, and developing a detailed budget. Although all five issues listed are important, the information usage issue deserves special attention. Successful implementation is strongly dependent on the organization's ability to learn how to use the new information provided by ABM. Users must be convinced that this new information can solve specific problems. They also need to be trained to use activity-based costing information to produce better decisions, and they need to understand how ABM drives and supports continuous improvement.

Activity Identification, Definition, and Classification

Identifying, defining, and classifying activities requires more attention for ABM than for ABC. The activity dictionary should include a detailed listing of the tasks that define each activity. Knowing the tasks that define an activity can be very helpful for improving the efficiency of value-added activities. Classification of activities also allows ABM to connect with other continuous improvement initiatives such as JIT, total quality management, and total environmental quality cost management. For example, identifying quality-related and environmental activities enables management to focus attention on the non-value-added activities of the quality and environmental categories. ABC also provides a more complete understanding of the effect that quality and environmental costs have on products, processes, and customers. It is important to realize that successful implementation requires time and patience. This is especially true when it comes to using the new information provided by an ABM system. For example, one survey revealed that it takes an average of 3.1 years for nonaccounting personnel to grow accustomed to using ABC information.⁸

Why ABM Implementations Fail

ABM can fail as a system for a variety of reasons. One of the major reasons is the lack of support of higher-level management. Not only must this support be obtained before undertaking an implementation project, but it must also be maintained. Loss of support can occur if the implementation takes too long or the expected results do not

8. Kip. R. Krumwiede, "ABC: Why It's Tried and How It Succeeds," *Management Accounting* (April 1998): 32-38.

materialize. Results may not occur as expected because operating and sales managers do not have the expertise to use the new activity information. Thus, significant efforts to train and educate need to be undertaken. Advantages of the new data need to be spelled out carefully, and managers must be taught how these data can be used to increase efficiency and productivity. Resistance to change should be expected; it is not unusual for managers to receive the new cost information with skepticism. Showing how this information can enable them to be better managers should help to overcome this resistance. Involving nonfinancial managers in the planning and implementation stages may also reduce resistance and secure the required support.

Failure to integrate the new system is another major reason for an ABM system breakdown. The probability of success is increased if the ABM system is not in competition with other improvement programs or the official accounting system. It is important to communicate the concept that ABM complements and enhances other improvement programs. Moreover, it is important that ABM be integrated to the point that activity costing outcomes are not in direct competition with the traditional accounting numbers. Managers may be tempted to continue using the traditional accounting numbers in lieu of the new data.

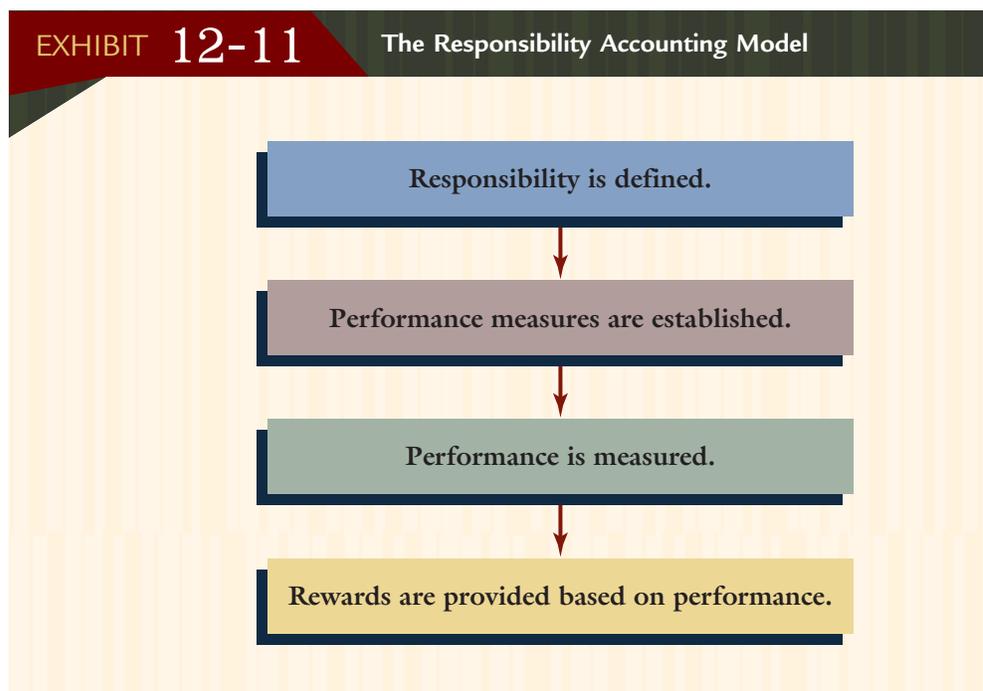
Financial-Based versus Activity-Based Responsibility Accounting

Responsibility accounting is a fundamental tool of managerial control and is defined by four essential elements: (1) assigning responsibility, (2) establishing performance measures or benchmarks, (3) evaluating performance, and (4) assigning rewards. The objective of responsibility accounting is to influence behavior in such a way that individual and organizational initiatives are aligned to achieve a common goal or goals. Exhibit 12-11 illustrates the responsibility accounting model.

A particular responsibility accounting system is defined by how the four elements in Exhibit 12-11 are defined. Three types of responsibility accounting systems have evolved over time: *financial-based*, *activity-based*, and *strategic-based*. All three are found in practice today. Essentially, firms choose the responsibility accounting system that is

OBJECTIVE 5

Explain how activity-based management is a form of responsibility accounting, and tell how it differs from financial-based responsibility accounting.



compatible with the requirements and economics of their particular operating environment. Firms that operate in a stable environment with standardized products and processes and low competitive pressures will likely find the less complex, financial-based responsibility accounting systems to be quite adequate. As organizational complexity increases and the competitive environment becomes much more dynamic, activity-based and strategic-based systems are likely to be more suitable. Strategic-based responsibility accounting systems are discussed in Chapter 13.

The responsibility accounting system for a stable environment is referred to as *financial-based responsibility accounting*. A **financial-based responsibility accounting system** assigns responsibility to organizational units and expresses performance measures in financial terms. It emphasizes a financial perspective. *Activity-based responsibility accounting*, on the other hand, is the responsibility accounting system developed for those firms operating in continuous improvement environments. **Activity-based responsibility accounting** assigns responsibility to processes and uses both financial and nonfinancial measures of performance, thus emphasizing both financial and process perspectives. A comparison of each of the four elements of the responsibility accounting model for each responsibility system reveals the key differences between the two approaches.

Assigning Responsibility

Exhibit 12-12 lists the differences in responsibility assignments between the two systems. Financial-based responsibility accounting focuses on *functional* organizational units and individuals. First, a responsibility center is identified. This center is typically an organizational unit such as a plant, department, or production line. Whatever the functional unit is, responsibility is assigned to the individual in charge. Responsibility is defined in financial terms (for example, costs). Emphasis is on achieving optimal financial results at the local level (i.e., organizational unit level). Exhibit 12-12 reveals that in an activity- or process-based responsibility system, the focal point changes from units and individuals to processes and teams. Systemwide optimization is the emphasis. Also, financial responsibility continues to be vital. The reasons for the change in focus are simple. In a continuous improvement environment, the financial perspective translates into continuously *enhancing revenues, reducing costs, and improving asset utilization*. Creating this continuous growth and improvement requires an organization to constantly improve its capabilities of delivering value to customers and shareholders. A process perspective is chosen instead of an organizational-unit perspective because processes are the *sources* of value for customers and shareholders and because they are the key to achieving an organization's financial objectives. The customer can be internal or external to the organization. Procurement, new product development, manufacturing, and customer service are examples of processes.

Since processes are the way things are done, changing the way things are done means changing processes. Three methods can change the way things are done: *process*

EXHIBIT 12-12

Responsibility Assignments Compared

Financial-Based Responsibility

1. Organizational units
2. Local operating efficiency
3. Individual accountability
4. Financial outcomes

Activity-Based Responsibility

1. Processes
2. Systemwide efficiency
3. Team accountability
4. Financial outcomes

improvement, process innovation, and process creation. **Process improvement** refers to incremental and constant increases in the efficiency of an existing process. For example, **Medtronic Xomed**, a manufacturer of surgical products (for eyes, ears and nose specialists), improved their processes by providing written instructions telling workers the best way to do their jobs. Over a three-year period, the company reduced rework by 57%, scrap by 85%, and experienced a 38% reduction in the cost of its shipped products.⁹ Activity-based management is particularly useful for bringing about process improvements. Processes are made up of activities that are linked by a common objective. Listing these activities and classifying them as value-added or non-value-added immediately suggests a way to make the process better: eliminate the non-value-added activities.

Process innovation (business reengineering) refers to the performance of a process in a radically new way with the objective of achieving dramatic improvements in response time, quality, and efficiency. **IBM Credit**, for example, radically redesigned its credit approval process and reduced its time for preparing a quote from seven days to one; similarly, **Federal-Mogul**, a parts manufacturer, used process innovation to reduce development time for part prototypes from 20 weeks to 20 days.¹⁰ **Process creation** refers to the installation of an entirely new process with the objective of meeting customer and financial objectives. **Chemical Bank**, for example, identified three *new* internal processes: understanding customer segments, developing new products, and cross-selling the product line.¹¹ These new internal processes were viewed as critical by the bank's management for improving the customer and profit mix and creating an enabled organization. It should be mentioned that process creation does not mean that the process has to be *original* to the organization. It means that it is *new* to the organization. For example, developing new products is a process common to many organizations but evidently was new to Chemical Bank.

Many processes cut across functional boundaries. This facilitates an integrated approach that emphasizes the firm's value-chain activities. It also means that cross-functional skills are needed for effective process management. Teams are the natural outcome of this process management requirement. Teams also improve the quality of work life by fostering friendships and a sense of belonging. Process improvement, innovation, and creation require significant group activity (and support) and cannot be carried out effectively by individuals. **General Electric, Xerox, Martin Marietta,** and **Aetna Life Insurance** have all begun to use teams as their basic work unit.¹²

Establishing Performance Measures

Once responsibility is defined, performance measures must be identified and standards set to serve as benchmarks for performance measurement. Exhibit 12-13 provides a comparison of the two systems' approach to the task of defining performance measures. According to Exhibit 12-13, budgeting and standard costing are the cornerstones of the benchmark activity for a financial-based system. This, of course, implies that performance measures are objective and financial in nature. Furthermore, they tend to support the status quo and are relatively stable over time. Exhibit 12-13 reveals some striking differences for firms operating in a continuous improvement environment. First, performance measures are process-oriented and, thus, must be concerned with process attributes such as process time, quality, and efficiency. Second, performance measurement standards are structured to support change. Therefore, standards are dynamic in nature. They change to reflect new conditions and new goals and to help maintain any

9. William Leventon, "Manufacturers Get Lean to Trim Waste," Medical Device & Diagnostic Industry, September, 2004.: Online journal, <http://www.devicelink.com/mddi/archive/04/09/contents.html>.

10. Thomas H. Davenport, *Process Innovation* (Boston: Harvard Business School Press, 1993): 2.

11. Norman Klein and Robert Kaplan, *Chemical Bank: Implementing the Balanced Scorecard* (Harvard Business School, Case 125-210, 1995): 5-6.

12. Davenport, *Process Innovation*, 97.

EXHIBIT 12-13**Performance Measures Compared****Financial-Based Measures**

1. Organizational unit budgets
2. Standard costing
3. Static standards
4. Currently attainable standards

Activity-Based Measures

1. Process-oriented standards
2. Value-added standards
3. Dynamic standards
4. Optimal standards

progress that has been realized. For example, standards can be set that reflect some desired level of improvement for a process. Once the desired level is achieved, the standard is changed to encourage an additional increment of improvement. In an environment where constant improvement is sought, standards cannot be static. Third, optimal standards assume a vital role. They set the ultimate achievement target and, thus, identify the potential for improvement. Finally, standards should reflect the value added by individual activities and processes. Identifying a value-added standard for each activity is much more ambitious than the traditional financial responsibility system. It expands control to include the entire organization.

Evaluating Performance

Exhibit 12-14 compares performance evaluation under financial- and activity-based responsibility accounting systems. In a financial-based framework, performance is measured by comparing actual outcomes with budgeted outcomes. In principle, individuals are held accountable only for those items over which they have control. Financial performance, as measured by the ability to meet or beat a stable financial standard, is strongly emphasized. In the activity-based framework, performance is concerned with more than just the financial perspective. The process perspective adds time, quality, and efficiency as critical dimensions of performance. Decreasing the time a process takes to deliver its output to customers is viewed as a vital objective. Thus, nonfinancial, process-oriented measures such as cycle-time and on-time deliveries become important. Performance is evaluated by gauging whether these measures are improving over time. The same is true for measures relating to quality and efficiency. Improving a process should translate into better financial results. Hence, measures of cost reductions achieved, trends in cost, and cost per unit of output are all useful indicators of whether a process has improved. Progress toward achieving optimal standards and interim standards needs to be measured. The objective is to provide low-cost, high-quality products, delivered on a timely basis.

EXHIBIT 12-14**Performance Evaluation Compared****Financial-Based Performance Evaluation**

1. Financial efficiency
2. Controllable costs
3. Actual versus standard
4. Financial measures

Activity-Based Performance Evaluation

1. Time reductions
2. Quality improvements
3. Cost reductions
4. Trend measurement

Assigning Rewards

In both systems, individuals are rewarded or penalized according to the policies and discretion of higher management. As Exhibit 12-15 shows, many of the same financial instruments (e.g., salary increases, bonuses, profit sharing, and promotions) are used to provide rewards for good performance. Of course, the nature of the incentive structure differs in each system. For example, the reward system in a financial-based responsibility accounting system is designed to encourage individuals to achieve or beat budgetary standards. Furthermore, for the activity-based responsibility system, rewarding individuals is more complicated than it is in a functional-based setting. Individuals simultaneously have accountability for team and individual performance. Since process-related improvements are mostly achieved through team efforts, group-based rewards are more suitable than individual rewards. In one company (a producer of electronic components), for example, optimal standards have been set for unit costs, on-time delivery, quality, inventory turns, scrap, and cycle time.¹³ Bonuses are awarded to the team whenever performance is maintained on all measures and improves on at least one measure. Notice the multidimensional nature of this measurement and reward system. Another difference concerns the notion of gainsharing versus profit sharing. Profit sharing is a global incentive designed to encourage employees to contribute to the overall financial well-being of the organization. Gainsharing is more specific. Employees are allowed to share in gains related to specific improvement projects. Gainsharing helps obtain the necessary buy-in for specific improvement projects inherent to activity-based management.

EXHIBIT 12-15 Rewards Compared	
Financial-Based Rewards	Activity-Based Rewards
1. Financial performance basis	1. Multidimensional performance basis
2. Individual rewards	2. Group rewards
3. Salary increases	3. Salary increases
4. Promotions	4. Promotions
5. Bonuses and profit sharing	5. Bonuses, profit sharing, and gainsharing

13. C. J. McNair, "Responsibility Accounting and Controllability Networks," *Handbook of Cost Management* (Boston: Warren Gorham Lamont, 1993): E41-E43.

SUMMARY

Activity-based management encompasses both activity-based costing and process value analysis. Activity-based costing is concerned with accurate assignment of costs to cost objects and is an important source of information for managing activities. ABC, however, is not concerned with the issue or presence of waste in activities. Identifying waste and its causes and eliminating it fall within the domain of process value analysis.

Process value analysis emphasizes activity management with the intent of maximizing systemwide performance. It consists of three elements: driver analysis, activity analysis, and performance measurement. Driver analysis is also referred to as root cause analysis. It seeks to identify why activities are performed. Activity analysis identifies all activities

and the resources they consume and classifies activities as value-added or non-value-added. Performance measurement is concerned with how well activities are performed.

Reporting value- and non-value-added costs is an integral part of a sound activity-based management system. Tracking trends in these costs over time is an effective control measure. Once management determines the source of non-value-added costs, a focused program of continuous improvement can be implemented. Kaizen costing is a well-accepted approach for reducing costs by eliminating waste. Activity flexible budgeting and activity capacity management offer additional control capabilities. Activity flexible budgeting differs from the traditional approach by using more than unit-level drivers to predict what costs will be at different levels of activity output.

Implementing an activity-based management system requires careful planning and execution. The objectives of the system must be identified and explained. The benefits of the system and the anticipated effects should also be noted. A key issue is assessing and managing the ability of the organization to implement, learn, and use the new activity information. Strong support from higher management is also critical.

A firm can adopt one of three responsibility accounting systems. Two are discussed in this chapter: financial-based responsibility accounting and activity-based responsibility accounting. Financial-based responsibility accounting focuses on organizational units such as departments and plants; uses financial outcome measures, static standards, and benchmarks to evaluate performance; and emphasizes status quo and organizational stability. Activity-based responsibility accounting focuses on processes, uses both operational and financial measures, employs dynamic standards, and emphasizes and supports continuous improvement.

REVIEW PROBLEMS AND SOLUTIONS

1 FINANCIAL-BASED RESPONSIBILITY ACCOUNTING VERSUS ACTIVITY-BASED RESPONSIBILITY ACCOUNTING

The labor standard for a company is two hours per unit produced, which includes setup time. At the beginning of the last quarter, 20,000 units had been produced and 44,000 hours used. The production manager was concerned about the prospect of reporting an unfavorable labor efficiency variance at the end of the year. Any unfavorable variance over 9 to 10 percent of the standard usually meant a negative performance rating. Bonuses were adversely affected by negative ratings. Accordingly, for the last quarter, the production manager decided to reduce the number of setups and use longer production runs. He knew that his production workers usually were within 5 percent of the standard. The real problem was with setup times. By reducing the setups, the actual hours used would be within 7 to 8 percent of the standard hours allowed.

Required:

1. Explain why the behavior of the production manager is unacceptable for a continuous improvement environment.
2. Explain how an activity-based responsibility accounting approach would discourage the kind of behavior described.

SOLUTION

1. In a continuous improvement environment, efforts are made to reduce inventories and eliminate non-value-added costs. The production manager is focusing on meeting the labor usage standard and is ignoring the impact on inventories that longer production runs may have.
2. Activity-based responsibility accounting focuses on activities and activity performance. For the setup activity, the value-added standard would be zero setup

time and zero setup costs. Thus, avoiding setups would neither save labor time nor affect the labor variance. Of course, labor variances themselves would not be computed—at least not at the operational level.

2 ACTIVITY VOLUME VARIANCE, UNUSED ACTIVITY CAPACITY, VALUE- AND NON-VALUE-ADDED COST REPORTS, KAIZEN STANDARDS

Pollard Manufacturing has developed value-added standards for its activities including material usage, purchasing, and inspecting. The value-added output levels for each of the activities, their actual levels achieved, and the standard prices are as follows:

<i>Activity</i>	<i>Activity Driver</i>	<i>SQ</i>	<i>AQ</i>	<i>SP</i>
Using lumber	Board feet	24,000	30,000	\$10
Purchasing	Purchase orders	800	1,000	50
Inspecting	Inspection hours	0	4,000	12

Assume that material usage and purchasing costs correspond to flexible resources (acquired as needed) and that inspection uses resources that are acquired in blocks or steps of 2,000 hours. The actual prices paid for the inputs equal the standard prices.

Required:

1. Assume that continuous improvement efforts reduce the demand for inspection by 30 percent during the year (actual activity usage drops by 30 percent). Calculate the volume and unused capacity variances for the inspection activity. Explain their meaning. Also, explain why there is no volume or unused capacity variance for the other two activities.
2. Prepare a cost report that details value- and non-value-added costs.
3. Suppose that the company wants to reduce all non-value-added costs by 30 percent in the coming year. Prepare kaizen standards that can be used to evaluate the company's progress toward this goal. How much will these measures save in resource spending?

SOLUTION

1. $SP \times SQ$	$SP \times AQ$	$SP \times AU$
$\$12 \times 0$	$\$12 \times 4,000$	$\$12 \times 2,800$
\$0	\$48,000	\$33,600
	Unused Capacity Variance	
Volume Variance	\$14,400 F	
\$48,000 U		

The activity volume variance is the non-value-added cost. The unused capacity variance measures the cost of the unused activity capacity. The other two activities have no volume variance or capacity variance because they use only flexible resources. No activity capacity is acquired in advance of usage; thus, there cannot be an unused capacity variance or a volume variance.

2.

	<i>Costs</i>		
	<i>Value-Added</i>	<i>Non-Value-Added</i>	<i>Total</i>
Using lumber	\$240,000	\$ 60,000	\$300,000
Purchasing	40,000	10,000	50,000
Inspecting	0	48,000	48,000
Total	<u>\$280,000</u>	<u>\$118,000</u>	<u>\$398,000</u>

3.

Kaizen Standards

	<i>Quantity</i>	<i>Cost</i>
Using lumber	28,200	\$282,000
Purchasing	940	47,000
Inspecting	2,800	33,600

If the standards are met, then the savings are as follows:

Using lumber: $\$10 \times 1,800 =$	$\$18,000$
Purchasing: $\$50 \times 60 =$	<u>3,000</u>
Savings	<u>\$21,000</u>

There is no reduction in resource spending for inspecting because it must be purchased in increments of 2,000 and only 1,200 hours were saved—another 800 hours must be reduced before any reduction in resource spending is possible. The unused capacity variance must reach \$24,000 before resource spending can be reduced.

KEY TERMS

Activity analysis 550	Financial-based responsibility accounting system 567
Activity capacity 562	Kaizen costing 553
Activity elimination 553	Kaizen standard 557
Activity flexible budgeting 559	Non-value-added activities 551
Activity output measure 550	Non-value-added costs 552
Activity reduction 553	Process creation 568
Activity selection 553	Process improvement 568
Activity sharing 553	Process innovation (business reengineering) 568
Activity volume variance 562	Process value analysis (PVA) 550
Activity-based management (ABM) 549	Responsibility accounting 566
Activity-based responsibility accounting 567	Unused capacity variance 563
Benchmarking 558	Value-added activities 551
Continuous improvement 548	Value-added costs 551
Driver analysis 550	Value-added standard 554
Financial measures 554	

QUESTIONS FOR WRITING AND DISCUSSION

1. What are the two dimensions of the activity-based management model? How do they differ?
2. What is driver analysis? What role does it play in process value analysis?
3. What is activity analysis? Why is this approach compatible with the goal of continuous improvement?
4. What are value-added activities? Value-added costs?
5. What are non-value-added activities? Non-value-added costs? Give an example of each.

6. Identify and define four different ways to manage activities so that costs can be reduced.
7. What is a kaizen standard? Describe the kaizen and maintenance subcycles.
8. Explain how benchmarking can be used to improve activity performance.
9. Explain how activity flexible budgeting differs from functional-based flexible budgeting.
10. In implementing an ABM system, what are some of the planning considerations?
11. Explain why a detailed task description is needed for ABM and not for ABC.
12. What are some of the reasons that ABM implementation may lose the support of higher management?
13. Explain how lack of integration of an ABM system may cause its failure.
14. Describe a financial-based responsibility accounting system.
15. Describe an activity-based responsibility accounting system. How does it differ from financial-based responsibility accounting?

EXERCISES

12-1 ABC VERSUS ABM

LO1, LO2

Timesaver, Inc., produces deluxe and regular microwaves. Recently, Timesaver has been losing market share with its regular microwaves because of competitors offering a product with the same quality and features but at a lower price. A careful market study revealed that if Timesaver could reduce its regular model price by \$10 per unit, it would regain its former share of the market. Management, however, is convinced that any price reduction must be accompanied by a cost reduction of \$10 so that per-unit profitability is not affected. Earlene Day has indicated that poor overhead costing assignments may be distorting management's view of each product's cost and, therefore, the ability to know how to set selling prices. Earlene has identified the following overhead activities: machining, testing, and rework. The three activities, their costs, and practical capacities are as follows:

<i>Activity</i>	<i>Cost</i>	<i>Practical Capacity</i>
Machining	\$1,800,000	150,000 machine hours
Testing	1,200,000	40,000 testing hours
Rework	600,000	20,000 rework hours

The consumption patterns of the two products are as follows:

	<i>Regular</i>	<i>Deluxe</i>
Units	100,000	10,000
Machine hours	50,000	10,000
Testing hours	20,000	20,000
Rework hours	5,000	15,000

Timesaver assigns overhead costs to the two products using a plantwide rate based on machine hours.

Required:

1. Calculate the unit overhead cost of the regular microwave product using machine hours to assign overhead costs. Now, repeat the calculation using ABC to assign overhead costs. Did improving the accuracy of cost assignments solve Timesaver's competitive problem? What did it reveal?

2. Now, assume that *in addition* to improving the accuracy of cost assignments, Earlene observes that defective supplier components are the root cause of both the testing and rework activities. Suppose further that Timesaver has found a new supplier that provides higher-quality components such that testing and rework costs are reduced by 50 percent. Now, calculate the cost of each product (assuming that testing and rework time are also reduced by 50 percent) using ABC. The relative consumption patterns also remain the same. Comment on the difference between ABC and ABM.

12-2 ROOT CAUSE (DRIVER ANALYSIS)

- LO2** For the following two activities, ask a series of “why” questions (with your answers) that reveal the root cause. Once the root cause is identified, use a “how” question to reveal how the activity can be improved (with your answer).

Activity 1: Daily cleaning of a puddle of oil near production machinery.

Activity 2: Providing customers with sales allowances.

12-3 NON-VALUE-ADDED ACTIVITIES: NON-VALUE-ADDED COST

- LO2** Honley Company has 20 clerks that work in its accounts payable department. A study revealed the following activities and the relative time demanded by each activity:

<i>Activities</i>	<i>Percentage of Clerical Time</i>
Comparing purchase orders and receiving orders and invoices	15%
Resolving discrepancies among the three documents	70
Preparing checks for suppliers	10
Making journal entries and mailing checks	5

The average salary of a clerk is \$30,000.

Required:

Classify the four activities as value-added or non-value-added, and calculate the clerical cost of each activity. For non-value-added activities, indicate why they are non-value-added.

12-4 ROOT CAUSE (DRIVER) ANALYSIS

- LO2** Refer to Exercise 12-3.

Required:

Suppose that clerical error—either Honley’s or the supplier’s—is the common root cause of the non-value-added activities. For each non-value-added activity, ask a series of “why” questions that identify clerical error as the activity’s root cause.

12-5 PROCESS IMPROVEMENT/INNOVATION

- LO2, LO5** Refer to Exercise 12-3. Suppose that clerical error is the common root cause of the non-value-added activities. Paying bills is a subprocess that belongs to the procurement process. The procurement process is made up of three subprocesses: purchasing, receiving, and paying bills.

Required:

1. What is the definition of a process? Identify the common objective for the procurement process. Repeat for each subprocess.
2. Now, suppose that Honley decides to attack the root cause of the non-value-added activities of the bill-paying process by improving the skills of its purchasing and receiving clerks. As a result, the number of discrepancies found drops by 30 percent. Discuss the potential effect this initiative might have on the bill-paying process. Does this initiative represent process improvement or process innovation? Explain.

12-6 PROCESS IMPROVEMENT/INNOVATION

LO2, LO5 Refer to **Exercise 12-5**. Suppose that Honley attacks the root cause of the non-value-added activities by establishing a totally different approach to procurement called electronic data interchange (EDI). EDI gives suppliers access to Honley's online database that reveals Honley's production schedule. By knowing Honley's production schedule, suppliers can deliver the parts and supplies needed just in time for their use. When the parts are shipped, an electronic message is sent from the supplier to Honley that the shipment is en route. When the order arrives, a bar code is scanned with an electronic wand initiating payment for the goods. EDI involves no paper—no purchase orders—no receiving orders—and no invoices.

Required:

Discuss the potential effects of this solution on Honley's bill-paying process. Is this process innovation or process improvement? Explain.

12-7 VALUE- AND NON-VALUE-ADDED COSTS, UNUSED CAPACITY

LO2, LO3 For Situations 1 through 6, provide the following information:

- a. An estimate of the non-value-added cost caused by each activity.
 - b. The root causes of the activity cost (such as plant layout, process design, and product design).
 - c. The appropriate cost reduction measure: activity elimination, activity reduction, activity sharing, or activity selection.
1. It takes 45 minutes and six pounds of material to produce a product using a traditional manufacturing process. A process reengineering study provided a new manufacturing process design (using existing technology) that would take 15 minutes and four pounds of material. The cost per labor hour is \$12, and the cost per pound of material is \$8.
 2. With its original design, a product requires 15 hours of setup time. Redesigning the product could reduce the setup time to an absolute minimum of 30 minutes. The cost per hour of setup time is \$200.
 3. A product currently requires eight moves. By redesigning the manufacturing layout, the number of moves can be reduced from eight to zero. The cost per move is \$10.
 4. Inspection time for a plant is 8,000 hours per year. The cost of inspection consists of salaries of four inspectors, totaling \$120,000. Inspection also uses supplies costing \$2 per inspection hour. A supplier evaluation program, product redesign, and process redesign reduced the need for inspection by creating a zero-defect environment.
 5. Each unit of a product requires five components. The average number of components is 5.3 due to component failure, requiring rework and extra components.

By developing relations with the right suppliers and increasing the quality of the purchased component, the average number of components can be reduced to five components per unit. The cost per component is \$600.

- A plant produces 100 different electronic products. Each product requires an average of eight components that are purchased externally. The components are different for each part. By redesigning the products, it is possible to produce the 100 products so that they all have four components in common. This will reduce the demand for purchasing, receiving, and paying bills. Estimated savings from the reduced demand are \$900,000 per year.

12-8 CALCULATION OF VALUE- AND NON-VALUE-ADDED COSTS, ACTIVITY VOLUME AND UNUSED CAPACITY VARIANCES

LO2, LO3, LO4



Calculo produces a variety of pocket PCs. Due to competitive pressures, the company is implementing an activity-based management (ABM) system with the objective of reducing costs. ABM focuses attention on processes and activities. Inspecting incoming goods was among the processes (activities) that were carefully studied. The study revealed that the number of inspection hours was a good driver for inspecting goods. During the last year, the company incurred fixed inspection costs of \$400,000 (salaries of 10 employees). The fixed costs provide a capacity of 20,000 hours (2,000 per employee at practical capacity). Management decided that inspecting incoming goods is a non-value-added activity. The number of actual inspection hours used in the most recent period was 18,000.

Required:

- Calculate the volume and unused capacity variances for inspecting. Explain what each variance means.
- Prepare a report that presents value-added, non-value-added, and actual costs for inspecting. Explain why highlighting the non-value-added costs is important.
- Explain why inspecting should be viewed as a non-value-added activity. In providing your explanation, consider the following counterargument: "Inspecting incoming goods adds value because it reduces the demand for other unnecessary activities such as rework, reordering, and warranty work."
- Assume that management is able to reduce the demand for the inspecting activity so that the actual hours needed drop from 18,000 to 9,000. What actions should now be taken regarding activity capacity management?

12-9 COST REPORT, VALUE-ADDED AND NON-VALUE-ADDED COSTS

LO2, LO3



Zurcher Company has developed value-added standards for four activities: purchasing parts, receiving parts, moving parts, and setting up equipment. The activities, the activity drivers, the standard and actual quantities, and the price standards for 2006 are as follows:

<i>Activities</i>	<i>Activity Driver</i>	<i>SQ</i>	<i>AQ</i>	<i>SP</i>
Purchasing parts	Purchase orders	1,000	1,400	\$150
Receiving parts	Receiving orders	2,000	3,000	100
Moving parts	Number of moves	0	1,000	200
Setting up equipment	Setup hours	0	4,000	60

The actual prices paid per unit of each activity driver were equal to the standard prices.

Required:

1. Prepare a cost report that lists the value-added, non-value-added, and actual costs for each activity.
2. Which activities are non-value-added? Explain why. Also, explain why value-added activities can have non-value-added costs.

12-10 TREND REPORT, NON-VALUE-ADDED COSTS

LO2, LO3

Refer to **Exercise 12-9**. Suppose that for 2007, Zurcher Company has chosen suppliers that provide higher-quality parts and redesigned its plant layout to reduce material movement. Additionally, Zurcher implemented a new setup procedure and provided training for its purchasing agents. As a consequence, less setup time is required and fewer purchasing mistakes are made. At the end of 2007, the following information is provided:

<i>Activities</i>	<i>Activity Driver</i>	<i>SQ</i>	<i>AQ</i>	<i>SP</i>
Purchasing parts	Purchase orders	1,000	1,200	\$150
Receiving parts	Receiving orders	2,000	2,400	100
Moving parts	Number of moves	0	400	200
Setting up equipment	Setup hours	0	1,000	60

Required:

1. Prepare a report that compares the non-value-added costs for 2007 with those of 2006.
2. What is the role of activity reduction for non-value-added activities? For value-added activities?
3. Comment on the value of a trend report.

12-11 IMPLEMENTATION OF ACTIVITY-BASED MANAGEMENT

LO4

Jane Erickson, manager of an electronics division, was not pleased with the results that had recently been reported concerning the division's activity-based management implementation project. For one thing, the project had taken eight months longer than projected and had exceeded the budget by nearly 35 percent. But even more vexatious was the fact that after all was said and done, about three-fourths of the plants were reporting that the activity-based product costs were not much different for most of the products than those of the old costing system. Plant managers were indicating that they were continuing to use the old costs as they were easier to compute and understand. Yet, at the same time, they were complaining that they were having a hard time meeting the bids of competitors. Reliable sources were also revealing that the division's product costs were higher than many competitors'. This outcome perplexed plant managers because their control system still continued to report favorable materials and labor efficiency variances. They complained that ABM had failed to produce any significant improvement in cost performance.

Jane decided to tour several of the plants and talk with the plant managers. After the tour, she realized that her managers did not understand the concept of non-value-added costs nor did they have a good grasp of the concept of kaizen costing. No efforts were being made to carefully consider the activity information that had been produced. One typical plant manager threw up his hands and said: "This is too much data. Why should I care about all this detail? I do not see how this can help me improve my plant's performance. They tell me that inspection is not a necessary activity and does not add value. I simply can't believe that inspecting isn't value-added and necessary. If we did not inspect, we would be making and sending more bad products to customers."

Required:

Explain why Jane's division is having problems with its ABM implementation.

12-12 FINANCIAL-BASED VERSUS ACTIVITY-BASED RESPONSIBILITY ACCOUNTING

LOS For each of the following situations, two scenarios are described, labeled A and B. Choose which scenario is descriptive of a setting corresponding to activity-based responsibility accounting and which is descriptive of financial-based responsibility accounting. Provide a brief commentary on the differences between the two systems for each situation, addressing the possible advantages of the activity-based view over the financial-based view.

Situation 1

A: The purchasing manager, receiving manager, and accounts payable manager are given joint responsibility for procurement. The charges given to the group of managers are to reduce costs of acquiring materials, decrease the time required to obtain materials from outside suppliers, and reduce the number of purchasing mistakes (e.g., wrong type of materials or the wrong quantities ordered).

B: The plant manager commended the manager of the grinding department for increasing his department's machine utilization rates—and doing so without exceeding the department's budget. The plant manager then asked other department managers to make an effort to obtain similar efficiency improvements.

Situation 2

A: Delivery mistakes had been reduced by 70 percent, saving over \$40,000 per year. Furthermore, delivery time to customers had been cut by two days. According to company policy, the team responsible for the savings was given a bonus equal to 25 percent of the savings attributable to improving delivery quality. Company policy also provided a salary increase of 1 percent for every day saved in delivery time.

B: Bill Johnson, manager of the product development department, was pleased with his department's performance on the last quarter's projects. They had managed to complete all projects under budget, virtually assuring Bill of a fat bonus, just in time to help with this year's Christmas purchases.

Situation 3

A: "Harvey, don't worry about the fact that your department is producing at only 70 percent capacity. Increasing your output would simply pile up inventory in front of the next production department. That would be costly for the organization as a whole. Sometimes, one department must reduce its performance so that the performance of the entire organization can improve."

B: "Susan, I am concerned about the fact that your department's performance measures have really dropped over the past quarter. Labor usage variances are unfavorable, and I also see that your machine utilization rates are down. Now, I know you are not a bottleneck department, but I get a lot of flack when my managers' efficiency ratings drop."

Situation 4

A: Colby was muttering to himself. He had just received last quarter's budgetary performance report. Once again, he had managed to spend more than budgeted for both materials and labor. The real question now was how to improve his performance for the next quarter.

B: Great! Cycle time had been reduced and, at the same time, the number of defective products had been cut by 35 percent. Cutting the number of defects reduced production costs by more than planned. Trends were favorable for all three performance measures.

Situation 5

A: Cambry was furious. An across-the-board budget cut! “How can they expect me to provide the computer services required on less money? Management is convinced that costs are out of control, but I would like to know where—at least in my department!”

B: After a careful study of the accounts payable department, it was discovered that 80 percent of an accounts payable clerk’s time was spent resolving discrepancies between the purchase order, receiving document, and the supplier’s invoice. Other activities such as recording and preparing checks consumed only 20 percent of a clerk’s time. A re-design of the procurement process eliminated virtually all discrepancies and produced significant cost savings.

Situation 6

A: Five years ago, the management of Breeann Products commissioned an outside engineering consulting firm to conduct a time-and-motion study so that labor efficiency standards could be developed and used in production. These labor efficiency standards are still in use today and are viewed by management as an important indicator of productive efficiency.

B: Janet was quite satisfied with this quarter’s labor performance. When compared with the same quarter of last year, labor productivity had increased by 23 percent. Most of the increase was due to a new assembly approach suggested by production line workers. She was also pleased to see that materials productivity had increased. The increase in materials productivity was attributed to reducing scrap because of improved quality.

Situation 7

A: “The system converts materials into products, not people at work stations. Therefore, process efficiency is more important than labor efficiency—but we also must pay particular attention to those who use the products we produce, whether inside or outside the firm.”

B: “I was quite happy to see a revenue increase of 15 percent over last year, especially when the budget called for a 10 percent increase. However, after reading the recent copy of our trade journal, I now wonder whether we are doing so well. I found out that the market expanded by 30 percent, and our leading competitor increased its sales by 40 percent.”

PROBLEMS**12-13 ABM IMPLEMENTATION, ACTIVITY ANALYSIS, ACTIVITY DRIVERS, DRIVER ANALYSIS, BEHAVIORAL EFFECTS****LO1, LO2,
LO4**

Joseph Fox, controller of Thorpe Company, has been in charge of a project to install an activity-based cost management system. This new system is designed to support the company’s efforts to become more competitive. For the past six weeks, he and the project committee members have been identifying and defining activities, associating workers with activities, and assessing the time and resources consumed by individual activities. Now, he and the project committee are focusing on three additional implementation issues: (1) identifying activity drivers, (2) assessing value content, and (3) identifying cost drivers (root causes). Joseph has assigned a committee member the responsibilities of assessing the value content of five activities, choosing a suitable activity driver for each activity, and identifying the possible root causes of the activities. Following are the five activities with possible activity drivers:

<i>Activity</i>	<i>Possible Activity Drivers</i>
Setting up equipment	Setup time, number of setups
Performing warranty work	Warranty hours, number of defective units
Welding subassemblies	Welding hours, subassemblies welded
Moving materials	Number of moves, distance moved
Inspecting components	Hours of inspection, number of defective components

The committee member ran a regression analysis for each potential activity driver, using the method of least squares to estimate the variable and fixed cost components. In all five cases, costs were highly correlated with the potential drivers. Thus, all drivers appeared to be good candidates for assigning costs to products. The company plans to reward production managers for reducing product costs.

Required:

1. What is the difference between an activity driver and a cost driver? In answering the question, describe the purpose of each type of driver.
2. For each activity, assess the value content and classify each activity as value-added or non-value-added (justify the classification). Identify some possible root causes of each activity, and describe how this knowledge can be used to improve activity performance. For purposes of discussion, assume that the value-added activities are not performed with perfect efficiency.
3. Describe the behavior that each activity driver will encourage, and evaluate the suitability of that behavior for the company's objective of becoming more competitive.

12-14 ABM, KAIZEN COSTING

LO2, LO3, LO5

Daspart, Inc. supplies carburetors for a large automobile manufacturing company. The auto company has recently requested that Daspart decrease its delivery time. Daspart made a commitment to reduce the lead time for delivery from eight days to two days. To help achieve this goal, engineering and production workers had made the commitment to reduce time for the setup activity (other activities such as moving materials and rework were also being examined simultaneously). Current setup times were 12 hours. Setup cost was \$300 per setup hour. For the first quarter, engineering developed a new process design that it believed would reduce the setup time from 12 hours to eight hours. After implementing the design, the actual setup time dropped from 12 hours to nine hours. In the second quarter, production workers suggested a new setup procedure. Engineering gave the suggestion a positive evaluation, and they projected that the new approach would save an additional five hours of setup time. Setup labor was trained to perform the new setup procedures. The actual reduction in setup time based on the suggested changes was six hours.

Required:

1. What kaizen setup standard would be used at the beginning of each quarter?
2. Describe the kaizen subcycle using the two quarters of data provided by Daspart.
3. Describe the maintenance subcycle using the two quarters of data provided by Daspart.
4. How much non-value-added cost was eliminated by the end of two quarters? Discuss the role of kaizen costing in activity-based management.
5. Explain why kaizen costing is compatible with activity-based responsibility accounting while standard costing is compatible with financial-based responsibility accounting.

12-15 ACTIVITY FLEXIBLE BUDGETING, PERFORMANCE REPORT, VOLUME VARIANCE

LO3 Innovator, Inc., wants to develop an activity flexible budget for the activity of moving materials. Innovator uses eight forklifts to move materials from receiving to stores. The forklifts are also used to move materials from stores to the production area. The forklifts are obtained through an operating lease that costs \$12,000 per year per forklift. Innovator employs 25 forklift operators who receive an average salary of \$45,000 per year, including benefits. Each move requires the use of a crate. The crates are used to store the parts and are emptied only when used in production. Crates are disposed of after one cycle (two moves), where a cycle is defined as a move from receiving to stores to production. Each crate costs \$1.20. Fuel for a forklift costs \$1.80 per gallon. A gallon of gas is used every 20 moves. Forklifts can make three moves per hour and are available for 280 days per year, 24 hours per day (the remaining time is downtime for various reasons). Each operator works 40 hours per week and 50 weeks per year.

Required:

1. Prepare a flexible budget for the activity of moving materials, using the number of cycles as the activity driver.
2. Calculate the activity capacity for moving materials. Suppose Innovator works 90 percent of activity capacity and incurs the following costs:

Salaries	\$1,170,000
Leases	96,000
Crates	91,200
Fuel	14,450

Prepare the budget for the 90 percent level and then prepare a performance report for the moving materials activity.

3. Calculate and interpret the volume variance for moving materials.
4. Suppose that a redesign of the plant layout reduces the demand for moving materials to one-third of the original capacity. What would be the budget formula for this new activity level? What is the budgeted cost for this new activity level? Has activity performance improved? How does this activity performance evaluation differ from that described in Requirement 2? Explain.

12-16 ACTIVITY-BASED MANAGEMENT, NON-VALUE-ADDED COSTS, TARGET COSTS, KAIZEN COSTING

LO2, LO3 Jerry Goff, president of Harmony Electronics, was concerned about the end-of-the-year marketing report that she had just received. According to Emily Hagood, marketing manager, a price decrease for the coming year was again needed to maintain the company's annual sales volume of integrated circuit boards (CBs). This would make a bad situation worse. The current selling price of \$18 per unit was producing a \$2-per-unit profit—half the customary \$4-per-unit profit. Foreign competitors keep reducing their prices. To match the latest reduction would reduce the price from \$18 to \$14. This would put the price below the cost to produce and sell it. How could the foreign firms sell for such a low price? Determined to find out if there were problems with the company's operations, Jerry decided to hire Jan Booth, a well-known consultant who specializes in methods of continuous improvement. Jan indicated that she felt that an activity-based management system needed to be implemented. After three weeks, Jan had identified the following activities and costs:

Batch-level activities:	
Setting up equipment	\$ 125,000
Materials handling	180,000
Inspecting products	122,000
Product-sustaining activities:	
Engineering support	120,000
Handling customer complaints	100,000
Filling warranties	170,000
Storing goods	80,000
Expediting goods	75,000
Unit-level activities:	
Using materials	500,000
Using power	48,000
Manual insertion labor ^a	250,000
Other direct labor	150,000
Total costs	<u>\$1,920,000^b</u>

^aDiodes, resistors, and integrated circuits are inserted manually into the circuit board.

^bThis total cost produces a unit cost of \$16 for last year's sales volume.

Jan indicated that some preliminary activity analysis shows that per-unit costs can be reduced by at least \$7. Since Emily had indicated that the market share (sales volume) for the boards could be increased by 50 percent if the price could be reduced to \$12, Jerry became quite excited.

Required:

1. What is activity-based management? What connection does it have to continuous improvement?
2. Identify as many non-value-added costs as possible. Compute the cost savings per unit that would be realized if these costs were eliminated. Was Jan correct in her preliminary cost reduction assessment? Discuss actions that the company can take to reduce or eliminate the non-value-added activities.
3. Compute the target cost required to maintain current market share, while earning a profit of \$4 per unit. Now, compute the target cost required to expand sales by 50 percent. How much cost reduction would be required to achieve each target?
4. Assume that Jan suggested that kaizen costing be used to help reduce costs. The first suggested kaizen initiative is described by the following: switching to automated insertion would save \$60,000 of engineering support and \$90,000 of direct labor. Now, what is the total potential cost reduction per unit available? With these additional reductions, can Harmony achieve the target cost to maintain current sales? To increase it by 50 percent? What form of activity analysis is this kaizen initiative: reduction, sharing, elimination, or selection?
5. Calculate income based on current sales, prices, and costs. Now, calculate the income using a \$14 price and a \$12 price, assuming that the maximum cost reduction possible is achieved (including Requirement 4's kaizen reduction). What price should be selected?

12-17 VALUE-ADDED AND KAIZEN STANDARDS, NON-VALUE-ADDED COSTS, VOLUME VARIANCE, UNUSED CAPACITY

LO3 Tom Young, vice president of Dunn Company (a producer of plastic products), has been supervising the implementation of an activity-based cost management system. One of Tom's objectives is to improve process efficiency by improving the activities that



define the processes. To illustrate the potential of the new system to the president, Tom has decided to focus on two processes: production and customer service.

Within each process, one activity will be selected for improvement: molding for production and sustaining engineering for customer service. (Sustaining engineers are responsible for redesigning products based on customer needs and feedback.) Value-added standards are identified for each activity. For molding, the value-added standard calls for nine pounds per mold. (Although the products differ in shape and function, their size, as measured by weight, is uniform.) The value-added standard is based on the elimination of all waste due to defective molds (materials is by far the major cost for the molding activity). The standard price for molding is \$15 per pound. For sustaining engineering, the standard is 60 percent of current practical activity capacity. This standard is based on the fact that about 40 percent of the complaints have to do with design features that could have been avoided or anticipated by the company.

Current practical capacity (at the end of 2006) is defined by the following requirements: 18,000 engineering hours for each product group that has been on the market or in development for five years or less, and 7,200 hours per product group of more than five years. Four product groups have less than five years' experience, and 10 product groups have more. There are 72 engineers, each paid a salary of \$70,000. Each engineer can provide 2,000 hours of service per year. There are no other significant costs for the engineering activity.

For 2006, actual pounds used for molding were 25 percent above the level called for by the value-added standard; engineering usage was 138,000 hours. There were 240,000 units of output produced. Tom and the operational managers have selected some improvement measures that promise to reduce non-value-added activity usage by 30 percent in 2007. Selected actual results achieved for 2007 are as follows:

Units produced	240,000
Pounds of material	2,600,000
Engineering hours	126,200

The actual prices paid per pound and per engineering hour are identical to the standard or budgeted prices.

Required:

1. For 2006, calculate the non-value-added usage and costs for molding and sustaining engineering. Also, calculate the cost of unused capacity for the engineering activity.
2. Using the targeted reduction, establish kaizen standards for molding and engineering (for 2007).
3. Using the kaizen standards prepared in Requirement 2, compute the 2007 usage variances, expressed in both physical and financial measures, for molding and engineering. (For engineering, explain why it is necessary to compare actual resource usage with the kaizen standard.) Comment on the company's ability to achieve its targeted reductions. In particular, discuss what measures the company must take to capture any realized reductions in resource usage.

12-18 BENCHMARKING AND NON-VALUE-ADDED COSTS, TARGET COSTING

LO2, LO3



Karebien, Inc., has two plants that manufacture a line of hospital beds. One is located in St. Louis and the other in Oklahoma City. Each plant is set up as a profit center. During the past year, both plants sold the regular model for \$810. Sales volume averages 20,000 units per year in each plant. Recently, the St. Louis plant reduced the price of the regular model to \$720. Discussion with the St. Louis manager revealed that the

price reduction was possible because the plant had reduced its manufacturing and selling costs by reducing what was called “non-value-added costs.” The St. Louis plant’s manufacturing and selling costs for the regular model were \$630 per unit. The St. Louis manager offered to loan the Oklahoma City plant his cost accounting manager to help it achieve similar results. The Oklahoma City plant manager readily agreed, knowing that his plant must keep pace—not only with the St. Louis plant but also with competitors. A local competitor had also reduced its price on a similar model, and Oklahoma City’s marketing manager had indicated that the price must be matched or sales would drop dramatically. In fact, the marketing manager suggested that if the price were dropped to \$702 by the end of the year, the plant could expand its share of the market by 20 percent. The plant manager agreed but insisted that the current profit per unit must be maintained. He also wants to know if the plant can at least match the \$630-per-unit cost of the St. Louis plant and if the plant can achieve the cost reduction using the approach of the St. Louis plant.

The plant controller and the St. Louis cost accounting manager have assembled the following data for the most recent year. The actual cost of inputs, their value-added (ideal) quantity levels, and the actual quantity levels are provided (for production of 20,000 units). Assume there is no difference between actual prices of activity units and standard prices.

	<i>SQ</i>	<i>AQ</i>	<i>Actual Cost</i>
Materials (lbs.)	427,500	450,000	\$ 9,450,000
Labor (hrs.)	102,600	108,000	1,350,000
Setups (hrs.)	—	7,200	540,000
Materials handling (moves)	—	18,000	1,260,000
Warranties (no. repaired)	—	18,000	1,800,000
Total			<u>\$14,400,000</u>

Required:

1. Calculate the target cost for expanding the Oklahoma City market share by 20 percent, assuming that the per-unit profitability is maintained as requested by the plant manager.
2. Calculate the non-value-added cost per unit. Assuming that non-value-added costs can be reduced to zero, can the Oklahoma City plant match the St. Louis plant’s per-unit cost? Can the target cost for expanding market share be achieved? What actions would you take if you were the plant manager?
3. Describe the role benchmarking played in the effort of the Oklahoma City plant to protect and improve its competitive position.

12-19 FINANCIAL VERSUS ACTIVITY FLEXIBLE BUDGETING

LO2, LO3, LO5

Kelly Gray, production manager, was upset with the latest performance report, which indicated that she was \$100,000 over budget. Given the efforts that she and her workers had made, she was confident that they had met or beat the budget. Now, she was not only upset but also genuinely puzzled over the results. Three items—direct labor, power, and setups—were over budget. The actual costs for these three items follow:

	<i>Actual Costs</i>
Direct labor	\$210,000
Power	135,000
Setups	<u>140,000</u>
Total	<u>\$485,000</u>

Kelly knew that her operation had produced more units than originally had been budgeted, so more power and labor had naturally been used. She also knew that the uncertainty in scheduling had led to more setups than planned. When she pointed this out to John Huang, the controller, he assured her that the budgeted costs had been adjusted for the increase in productive activity. Curious, Kelly questioned John about the methods used to make the adjustment.

JOHN: If the actual level of activity differs from the original planned level, we adjust the budget by using budget formulas—formulas that allow us to predict what the costs will be for different levels of activity.

KELLY: The approach sounds reasonable. However, I'm sure something is wrong here. Tell me exactly how you adjusted the costs of labor, power, and setups.

JOHN: First, we obtain formulas for the individual items in the budget by using the method of least squares. We assume that cost variations can be explained by variations in productive activity where activity is measured by direct labor hours. Here is a list of the cost formulas for the three items you mentioned. The variable X is the number of direct labor hours:

$$\begin{aligned}\text{Labor cost} &= \$10X \\ \text{Power cost} &= \$5,000 + \$4X \\ \text{Setup cost} &= \$100,000\end{aligned}$$

KELLY: I think I see the problem. Power costs don't have a lot to do with direct labor hours. They have more to do with machine hours. As production increases, machine hours increase more rapidly than direct labor hours. Also, . . .

JOHN: You know, you have a point. The coefficient of determination for power cost is only about 50 percent. That leaves a lot of unexplained cost variation. The coefficient for labor, however, is much better—it explains about 96 percent of the cost variation. Setup costs, of course, are fixed.

KELLY: Well, as I was about to say, setup costs also have very little to do with direct labor hours. And I might add that they certainly are not fixed—at least not all of them. We had to do more setups than our original plan called for because of the scheduling changes. And we have to pay our people when they work extra hours. It seems as if we are always paying overtime. I wonder if we simply do not have enough people for the setup activity. Supplies are used for each setup, and these are not cheap. Did you build these extra costs of increased setup activity into your budget?

JOHN: No, we assumed that setup costs were fixed. I see now that some of them could vary as the number of setups increases. Kelly, let me see if I can develop some cost formulas based on better explanatory variables. I'll get back with you in a few days.

Assume that after a few days' work, John developed the following cost formulas, all with a coefficient of determination greater than 90 percent:

$$\begin{aligned}\text{Labor cost} &= \$10X, \text{ where } X = \text{Direct labor hours} \\ \text{Power cost} &= \$68,000 + 0.9Y, \text{ where } Y = \text{Machine hours} \\ \text{Setup cost} &= \$98,000 + \$400Z, \text{ where } Z = \text{Number of setups}\end{aligned}$$

The actual measures of each of the activity drivers are as follows:

Direct labor hours	20,000
Machine hours	90,000
Number of setups	110

Required:

1. Prepare a performance report for direct labor, power, and setups using the direct-labor-based formulas.

2. Prepare a performance report for direct labor, power, and setups using the multiple cost driver formulas that John developed.
3. Of the two approaches, which provides the most accurate picture of Kelly's performance? Why?
4. After reviewing the approach to performance measurement, a consultant remarked that non-value-added cost trend reports would be a much better performance measurement approach than comparing actual costs with budgeted costs—even if activity flexible budgets were used. Do you agree or disagree? Explain.

12-20 ACTIVITY FLEXIBLE BUDGETING, NON-VALUE-ADDED COSTS

LO2, LO3, LO5

Douglas Davis, controller for Marston, Inc., prepared the following budget for manufacturing costs at two different levels of activity for 2007:

	<i>Level of Activity</i>	
<i>Driver: Direct Labor Hours</i>	50,000	100,000
Direct materials	\$ 300,000	\$ 600,000
Direct labor	200,000	400,000
Depreciation (plant)	100,000	100,000
Subtotal	<u>\$ 600,000</u>	<u>\$1,100,000</u>
<i>Driver: Machine Hours</i>	200,000	300,000
Maintaining equipment	\$ 360,000	\$ 510,000
Machining	112,000	162,000
Subtotal	<u>\$ 472,000</u>	<u>\$ 672,000</u>
<i>Driver: Material Moves</i>	20,000	40,000
Moving materials	\$ 165,000	\$ 290,000
<i>Driver: Number of Batches Inspected</i>	100	200
Inspecting products	\$ 125,000	\$ 225,000
Total	<u>\$1,362,000</u>	<u>\$2,287,000</u>

During 2007, Marston worked a total of 80,000 direct labor hours, used 250,000 machine hours, made 32,000 moves, and performed 120 batch inspections. The following actual costs were incurred:

Direct materials	\$440,000
Direct labor	355,000
Depreciation	100,000
Maintaining equipment	425,000
Machining	142,000
Moving materials	232,500
Inspecting products	160,000

Marston applies overhead using rates based on direct labor hours, machine hours, number of moves, and number of batches. The second level of activity (the right column in the preceding table) is the practical level of activity (the available activity for resources acquired in advance of usage) and is used to compute predetermined overhead pool rates.

Required:

1. Prepare a performance report for Marston's manufacturing costs in 2007.
2. Assume that one of the products produced by Marston is budgeted to use 10,000 direct labor hours, 15,000 machine hours, and 500 moves and will be

produced in five batches. A total of 10,000 units will be produced during the year. Calculate the budgeted unit manufacturing cost.

3. One of Marston's managers said the following: "Budgeting at the activity level makes a lot of sense. It really helps us manage costs better. But the previous budget really needs to provide more detailed information. For example, I know that the moving materials activity involves the use of forklifts and operators, and this information is lost when only the total cost of the activity for various levels of output is reported. We have four forklifts, each capable of providing 10,000 moves per year. We lease these forklifts for five years, at \$10,000 per year. Furthermore, for our two shifts, we need up to eight operators if we run all four forklifts. Each operator is paid a salary of \$30,000 per year. Also, I know that fuel costs about \$0.25 per move."

Assuming that these are the only three items, expand the detail of the flexible budget for moving materials to reveal the cost of these three resource items for 20,000 moves and 40,000 moves, respectively. Based on these comments, explain how this additional information can help Marston better manage its costs. (Especially consider how activity-based budgeting may provide useful information for non-value-added activities.)

12-21 COLLABORATIVE LEARNING EXERCISE

LO5 Howard Johnson, plant manager, was given the charge to produce 120,000 bolts used in the manufacture of small twin engine aircraft. Directed by his divisional manager to give the bolt production priority over other jobs, he had two weeks to produce the units. Meeting the delivery date was crucial for renewal of a major contract with a large airplane manufacturer. Each bolt requires 20 minutes of direct labor and five ounces of metal. After producing a batch of bolts, each bolt is subjected to a stress test. Those that pass are placed in a carton, which is stamped "Inspected by inspector no. ____" (the inspector's identification number is inserted). Defective units are discarded, having no salvage value. Because of the nature of the process, rework is not possible.

At the end of the first week, the plant had produced 60,000 acceptable units and used 24,000 direct labor hours, 4,000 hours more than the standard allowed. Furthermore, a total of 65,000 bolts had been produced and 5,000 had been rejected, creating an unfavorable materials usage variance of 25,000 ounces. Howard knew that a performance report would be prepared when the 120,000 bolts were completed. This report would compare the labor and materials used with that allowed. Any variance in excess of 5 percent of standard would be investigated. Howard expected the same or worse performance for the coming week and was worried about a poor performance rating for himself. Accordingly, at the beginning of the second week, Howard moved his inspectors to the production line (all inspectors had production experience). However, for reporting purposes, the production hours provided by inspectors would not be counted as part of direct labor. They would still appear as a separate budget item on the performance report. Additionally, Howard instructed the inspectors to pack the completed bolts in the cartons and stamp them as inspected. One inspector objected; Howard reassigned the inspector temporarily to materials handling and gave an inspection stamp with a fabricated identification number to a line worker who was willing to stamp the cartons of bolts as inspected.

Required:

Form groups of six and divide these groups into three categories: A, B, and C. Groups of Category A will solve Requirement 1, groups of Category B will solve Requirement 2, and groups of Category C will solve Requirement 3. After preparing an answer to each requirement, new groups will be formed made up of two members from A, two members from B, and two members from C. Members of A will share their answer to Requirement 1 with the other group members, followed by B members sharing their

answer with other group members, and finally, C members will share their answer with the other group members. (*Note:* The structure may be adapted to class size—the critical idea is to have three types of groups who solve each part and then come together to share with each other the answers to the other requirements.)

1. Explain why Howard stopped inspections on the bolts and reassigned inspectors to production and materials handling. Discuss the ethical ramifications of this decision.
2. What features in the financial-based responsibility accounting system provided the incentive(s) for Howard to take the actions described? Would an activity-based responsibility accounting system have provided incentives that discourage this kind of behavior? Explain.
3. What likely effect would Howard's actions have on the quality of the bolts? Was the decision justified by the need to obtain renewal of the contract, particularly if the plant returns to a normal inspection routine after the rush order is completed? Do you have any suggestions about the quality approach taken by this company? Explain why activity-based responsibility accounting might play a useful role in this setting.

12-22 CYBER RESEARCH CASE

LO1, LO2, LO3

The objective of benchmarking is to improve performance by identifying, understanding, and adopting outstanding best practices from others. If this process is carried out inside the organization, then it is called internal benchmarking. It is not uncommon for one facility within an organization to have better practices than another. Unfortunately, it is unusual for these better practices to naturally spread throughout the organization. The American Productivity & Quality Center (APQC) has conducted a study to understand what prevents the transfer of practices within a company. It also has made some recommendations concerning internal benchmarking.

Required:

Access <http://www.apqc.org> and/or other Internet resources to see if you can answer the following:

1. Why is internal benchmarking an attractive option for an organization?
2. Why do companies want to engage in internal benchmarking?
3. What are some of the organizational obstacles relating to internal benchmarking?
4. Identify some recommendations that will make internal transfers of best practices more effective.
5. Internal benchmarking is a prominent example of what is called knowledge management or knowledge sharing. Use the APQC site and other Internet resources to define knowledge management (or knowledge sharing). Now, go to KnowledgeLeader and Internal Audit and Risk Management Community (<http://www.knowledgeleader.com>), and describe its external knowledge sharing service. (Alternatively, you may also wish to access and describe Ernst & Young's knowledge sharing service called "Ernie.")